Delhi Metropolitan Education
Affiliated to GGSIP University, New Delhi & Approved by Bar Council of India

CASE STUDY
doi: 10.53361/dmejm.v3i01.01

United Coal Limited: Preparing for Transformation

Jayanta Banerjee[1*], Loknath Debnath[2], Indranil Bose[3]

[1]*School of Business, Manipal Academy of Higher Education Dubai International Academic City, Dubai, UAE*
[2]*Quantiphi Analytics Solution, Bengaluru, Karnataka, India*
[3]*Adamas University, Kolkata, West Bengal, India*

Abstract

Organizations dealing with B2B products experience significant challenges when customers are unhappy. As the number of customers is few and volumes of transactions are high, customer satisfaction is essential for a company's well-being. CalTech Thermal Plant Corporation, a coal customer, lost 203 crores due to sub-standard coal being supplied by their long-term business ally UCL. As a result of a report by CalTech, the Minister of Natural resources and Power downgraded 250 coal mines of UCL after analyzing coal samples from various mines. UCL, a Government owned Maharatna status mining company, was a monopoly in coal extraction and selling in India for a long time. Over time, UCL has grown in size both in terms of the number of mines and employee strengths. However, a complacent and sheltered organization UCL was exposed to a bouquet of challenges starting from the closure of coal mines in 2017, its own in-house HR problems, threats from international competitors, and substitutes for their customer's products in the form of Solar power. The case study discusses the various environmental challenges influencing UCL to go for major strategic decisions to endure the present crisis. The management of UCL is at a crossroads in making the organization profitable and ready for future challenges.

ARTICLE INFO

***Correspondence:**
jayanta.february@gmail.com
School of Business, Manipal Academy of Higher Education Dubai International Academic City, Dubai, UAE

Dates:
Received: 18-10-2022
Accepted: 13-11-2022
Published: 24-12-2022

Keywords:
Environmental challenges, Infrastructure development, l coal mining, Human resource

How to Cite:
Banerjee J, Debnath L, Bose I. (2022) United Coal Limited: Preparing for Transformation. DME Journal of Management, 3(1), 1-7. doi: 10.53361/dmejm.v3i01.01

Introduction

The corporate boardroom was abuzz with activity. Despite cutting costs across all functions, the unit production cost of electricity is rising for Caltech Thermal Plant Corporation. The newly joined VP, Mr. Puri, is perplexed by seeing the production of the last two years. The dilemma for the thermal plant now is to ensure higher productivity and lower costs simultaneously while lowering emission levels significantly. Although Caltech is at the forefront of electric production, Mr. Puri is worried about converging clouds soon. With the price of coal escalating every quarter, he is contemplating diversifying to large-scale solar power generation.

The board room debate continued with Mr. Khanna, Director (Technical), being very vocal that the old electric generating equipment should be replaced with the latest energy-efficient equipments. He recommended that Caterpillar electric power systems consistently deliver value to worldwide customers through their dealers and consultants. For more than 80 years, they have been veterans in manufacturing equipments for thermal plants known to emit low

DME
Journal of Management
e-ISSN: 2582-9432

CO_2 in the atmosphere. On the contrary, Mr. Vinod, one of the board members, commented on the trade union leader's feedback that the recent coal supply could not generate heat to produce adequate steam to move the turbines efficiently. Additionally, low thermal efficiency forces plants to use more coal, leading to environmental pollution. After the meeting, Mr. Puri notified the Ministry of Natural Resources and Power (MNRP) regarding the issue. The Ministry of Natural Resources and Power formed an Inspection Committee regarding the reported issues. They made a detailed report highlighting the degradation of coal's quality in specific mines from where United Coal Limited's coal is extracted and sold to thermal power plants.

India aims to supply electricity to the entire mass and uplift millions from poverty. On the other hand, to overcome the greenhouse effect problem, it has to shift away from fossil fuels gradually. Although coal prices remain unchanged, the continuous fall in the photovoltaic system indicates that by 2020, solar energy will be more affordable than coal. Solar power will provide clean and affordable energy for the 400 million Indians without electricity. Bloomberg New Energy Finance states that by 2020 the ground-mounted photovoltaic systems will be more economical than the coal-powered plants in India.

One of India's eight essential and core infrastructure development sectors is power generation. The sector's importance can be easily understood from the significant emphasis assigned on the same. It is found from the available data that a weight of 10.3 has been assigned to the power generation sector in India, which the steel manufacturing sector has followed. In India, the steel manufacturing sector has been assigned a mere weightage of 6.7 (Table 1). It is also to be noted here that thermal power has been the source of predominantly 65 percent of total electricity generated in India. Most of the thermal power plants are coal-based, followed by gas-based units. Surprisingly even though India is the third-largest coal producer in the world, it is also the fourth-largest importer of coal. The primary reason behind India's need to import such huge volumes of coal is the country's relatively low-grade coal production. Anthracite variety coal with the highest heat generation capacity constitutes a small part of India's coal reserves.

The second best coal is bituminous, followed by lignite or peat genres. The power plants prefer the higher-grade coal in the bituminous category. India's inadequate availability of high-quality coal has created a dilemma (Table 2). This has indeed been responsible for lower energy generation. This situation has also led to the sizeable import of coal at significantly higher prices, which are necessarily mixed to improve the overall output.

Fewer imports, the curtailment of coal receipts by power plants, increased mines and roads, and excess power generation have led to a demand-supply gap. One of the primary reasons cited for the apparent conflicting trends of a demand-supply gap, low off-take and piling up of pit-head stocks was logjams in the distribution channels. During 2016 – 2017, the total demand for coal stood at 981 million tonnes, but total domestic supply was 795 million tonnes, creating a deficit (Table 3). India imported 190.95 million tonnes to fill the requirement by spending Rs 10, 0231.3 crores. According to ImaCS, a development consulting firm in India, in FY2017, coal demand will increase at an annual growth rate of 7 percent, leading to a demand-supply gap of 266MT (Negi et al., 2017). The imported coal will consist of mainly 35.5MT of coking coal and 230MT of thermal coal, most of which are expected to be used by thermal power plants and steel plants. Although most of the coal requirements can be sourced from domestic mines, in FY 2017 imports are estimated to increase by 27 percent (Lahiri-Dutt, K.,2016).

While coal is self-possessed for significant growth, it faces huge increasing environmental and social challenges. The key to the coal industry's future is the concerns related to the environment (Rosewarne, S. 2016). Coal has lesser energy efficiency and creates more pollution than other fossil fuels. At the regional level, the major areas of concern are the environmental impacts on air, land, water, forest, and biodiversity and the costs of reducing these. The effects of mine fires increased greenhouse gases, and the acid rain are the most significant environmental challenge for the coal industry. The coal industry is also facing the challenge of

sustainable development and the acceptance of its role from the community. The problem of Mining Induced Displacement and Resettlement (MIDR) creates a big risks in the sustainability of the society. MIDR includes the resettlement effect, which leads to the loss of assets physical and non-physical, including income-gaining assets and sources, fertile lands, homes, communities, historical, social & cultural sites, networks and ties etc. Other major concerns are health impacts, change in population dynamics, addictions, economic disparity, and frustration (Yang, et al., 2017).

India has around 20 coal-fired thermal plants with capacities of 2000 MW or above while the average energy efficiency of these plants is a mere 32.8 percent, according to a study carried out by Centre for Science and Environment (CSE) covering a total of 47 coal-fired power plants. CSC rated this efficiency level as among the lowest among the major coal-based thermal power generating countries while also noting that the average CO2 emission of these plants was 1.08 kg per kWh, which was 14 percent (Kumar, et al., 2019).

According to a study by the Centre for Science and Environment (CSE), of the 47 coal-fired power plants, India has about 20 coal-fired thermal plants with capacities of 2000 MW or above, but their average energy efficiency is only 32.8 percent. CSC noted that the average CO2 emission from these plants was 1.08 kg per kWh, which was 14%, and classified this efficiency level as one of the lowest among the major coal-based thermal power generating nations (Hewitt & Jackson, 2009).

United Coal Limited (UCL)

In India, coal mining started under the Government sector in 1956. Previously it was entirely under the private sector. United Coal Limited (UCL), a new public-sector company was formed in 1980 to provide better operational and organizational efficiency in the coal sector.

Within a short span, UCL became the largest coal producer in the world and was awarded the Maharatna status by the Government of India. UCL has 85 mining areas under operation in ten states of India (Table 4), and during the FY 2015-16, it produced 540.51 MT (million tonnes) of coal. As of April 2016, it has 450 coal mines, out of which 180 are open cast, 250 are underground and the remaining 20 are mixed mines. Lack of demand, improving competitiveness in terms of price from the renewable energy sector, and increasing regulatory risks have posed significant challenges to India's coal-fired power sector (Blondeel & Van de Graaf, 2018).

It has been observed in recent years that a sizable portion of private-sector investors are exiting the industry. The combination of high demand, low domestic coal production, regulatory barriers and environmental risks has further exacerbated this alarming tendency. A significant percentage of private sector investors have started to leave the sector. This concerning development has been further exacerbated by the interaction of demand, off-take, regulatory, and environmental risks. This recent development could be seen as a significant change from just three years ago, when the availability of coal was the main obstacle to India's expanding power generation capacity. In that case, despite a significant increase in coal production, the rise in electricity demand was insufficient to meet it.

According to a Credit Suisse report, one major reason for the slowdown in India's investment cycle is the decrease in domestic coal output (Dimson et al., 2017). On the other hand, challenges related to governance, corruption charges, inefficiency and the lack of pricing power have greatly impacted the performance. Another report by Greenpeace warns that nearly 120,000 people were killed in a year because of the Indian coal power plants. India's high-paced industrialization effert has led to a crisis in public health with a considerable number of premature deaths around 80-120,000 and 20 million new asthma cases in a year due to the pollution caused in air and water by the coal power plants. Vinuta Gupta of Greenpeace stated that, the present expansion of coal is illogical and dangerous. Coal mining is destroying many forests in India, tribal communities and endangered species. We are now well aware that thousands are killed by the pollution emitted while it is burned. Coal has completely failed to provide energy security. There is a need to prohibit new coal plants and certain ambitious policy incentives from unbolting India's huge

potential in the wind, solar and efficiency measures (Nair & Daniel, 2015).

As per the latest statement issued by the ministry, UCL will set up a 1000 Megawatt solar power generation capacity to reduce its carbon footprint. They have selected some isolated islands on the Bay of Bengal and some wastelands for solar power generation. Due to the increasing environmental concerns and solar energy availability, customers are shifting from coal to solar energy. The solar industry in India is edging closer to competing with thermal power. Solar electricity generation rates have decreased by more than 25% due to technological advancement and are edging closer to coal-powered electricity (Kumar, et al., 2017).

With the surplus in coal production and the decreased demand from the power generation companies, the government has asked the power plants to pay a 40% premium for the fuel as per a mechanism introduced in 2013. The above-mentioned mechanism in 2013 was implemented keeping in view the munch in coal supplies due to the excess coal production. UCL is even looking for options for starting the coal exporting business. Through the e-auction route, UCL had 113.8 million tonnes of coal reserved for the fiscal year 2016–17. Even though the price of coal has gradually decreased, they were pushing it through the e-auction route to increase profit. UCL has proposed that from July 2017 to March 2018, 105 million tonnes of coal will be sold through electronic auction. At the moment, UCL is selling coal through a number of e-auction schemes, including spot e-auction, special forward e-auction for power plants, exclusive e-auction for non-power generators, and special spot e-auction.

The Railways' single biggest source of income is coal transportation. Power plants have drastically reduced their coal inventory over the past year and now depend on UCL and Railways to deliver fuel just in time, which has driven up UCL's operational costs. A lower inventory helped power plants reduce costs and lower the cost of supplies to distribution companies, benefiting the entire country. To help close the gaps in logistics and boost operational effectiveness, UCL has brought the agenda for cooperation to the Railways.

According to some industry sources, the coal requirement for the power sector is projected to go up to 800 MT by 2017 and increase to 1070 MT by 2022 . On the other hand, domestic coal supply is estimated to increase to 554 MT by 2017 and 756 MT by 2022. By 2017, the total import of coal is predicted to reach about 200 MT . It is strongly believed that the next big hurdle for UCL could be the increased coal imports. The reason being, since last few years, with the increase in demand of coal, the production levels have failed to fulfill the demand. This situation is unlikely to change in the coming days, increasing the dependency on imported coal. This will adversely affect India's Current Account Deficit (CAD) in a very unfavorable manner. In the scenario of coal availability, currently India faces a huge scarcity of coal in the domestic market, leading to a large-scale deficit in the domestic coal in the power. India is the fourth largest coal producer in the world, but still there exists a huge demand-supply gap of coal. This is a severe problem and needs to be solved immediately as domestic and imported coal prices are increasing, which will disable the economics of the power sector (Soni, et al.,2016).

A state's degree of industrialization is related to its power demand. Currently, industry consumes 40% of the power generated, but this figure has been steadily declining over the last five years. In 2011-12, there was a 19% increase in the installation of coal-based capacity, but only a 1% increase in domestic coal production, resulting in a significant increase in imports. Power consumption is rising in the domestic household segment. The Indian government's aggressive electrification policy has resulted in the electrification of over 12,000 of the 18,452 unconnected villages since 2015. (Li, & Li, 2011).

Challenges for UCL

United Coal Limited found that in the inspection report, MNRP has downgraded 225 mines which translated to a loss of around 1080 crores and loss of employment of 15000 workers. Another issue that UCL experienced was the rampant corruption in the coal block allocations and pilferage during the transportation of coal. In order to tackle this issue, the E-auction process was started replacing the old manual bidding process. UCL is also facing

Table 1: Performance of Eight Core Industries

INDEX								
Sector	Weight	2011-12	2012-13	2013-14	2014-15	2015-16	Apr-Feb 2015-16	Apr-Feb 2016-17
Coal	4.379	141.5	148.1	150	162.2	169.3	164.6	169.2
Crude Oil	5.216	112.1	111.4	111.2	110.2	108.7	108.8	105.7
Natural Gas	1.708	149.7	128.1	111.5	106	101.5	102	100.1
Refinery Products	5.939	133.7	172.5	175	175.6	183.2	181.5	192.3
Fertilizers	1.254	103.8	100.2	101.8	101.7	114.4	114	116.4
Steel	6.684	174	181.1	201.9	211.4	210.5	209.6	228.8
Cement	2.406	175.2	188.7	194.5	205.3	215.3	212.6	211.1
Electricity	10.316	149.3	155.3	164.6	178.5	192.4	192.1	201.7
Overall Index	**37.903**	**145.3**	**154.7**	**161.2**	**168.5**	**174.7**	**173.5**	**181.2**

Source: Press Information Bureau, (Base: 2004-05=100) https://pib.gov.in/newsite/PrintRelease.aspx?relid=158730

Table 2: Different Coal Categories

Grade	Useful Heat Value (UHV) (Kcal/Kg) UHV= 8900-138(A+M)	Corresponding Ash% + Moisture % at (60% RH & 40OC)	Gross Calorific Value GCV (Kcal/ Kg) (at 5% moisture level)
A	Exceeding 6200	Not exceeding 19.5	Exceeding 6454
B	Exceeding 5600 but not exceeding 6200	19.6 to 23.8	Exceeding 6049 but not exceeding 6454
C	Exceeding 4940 but not exceeding 5600	23.9 to 28.6	Exceeding 5597 but not exceeding. 6049
D	Exceeding 4200 but not exceeding 4940	28.7 to 34.0	Exceeding 5089 but not Exceeding 5597
E	Exceeding 3360 but not exceeding 4200	34.1 to 40.0	Exceeding 4324 but not exceeding 5089
F	Exceeding 2400 but not exceeding 3360	40.1 to 47.0	Exceeding 3865 but not exceeding. 4324
G	Exceeding 1300 but not exceeding 2400	47.1 to 55.0	Exceeding 3113 but not exceeding 3865

Source: Energy Education https://energyeducation.ca/encyclopedia/Coal_types

Table 3: Demand and Supply Gap

Sector\Year	2012-13 (Budget Estimates) Million Tonnes			2016-17 (Projection by Planning Commission) Million Tonnes		
	Demand	Supply	Gap	Demand	Supply	Gap
Coking Coal						
Steel Industry	52	20	32	67	35	32
Non Coking Coal						
Power (Utilities)	512	405	107	682	520	162
Power (CPP)	43	45	-2	56	74	-17
Cement	30	15	16	47	23	24
Sponge Iron	35	24	11	50	57	-7
Others	100	71	29	77	85	-8
Non Coking Sub Total	721	560	161	913	760	154
Total Raw Coal Demand	**773**	**580**	**193**	**981**	**795**	**186**

Sourse: Ministry of Coal https://coal.gov.in/en/major-statistics/production-and-supplies

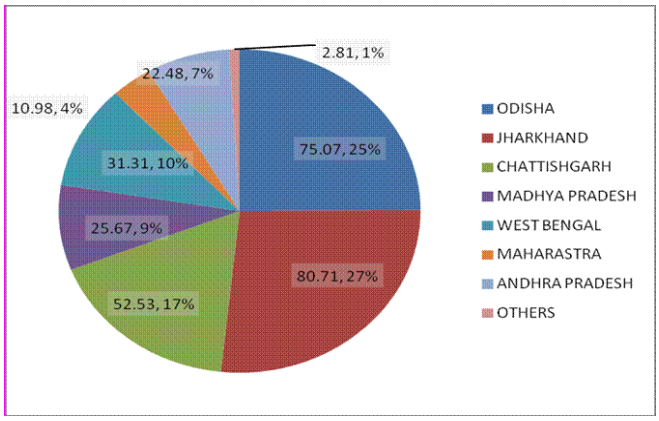

Figure 1: UCL's Coal Mining Zones

Source: Ministry of Coal https://coal.gov.in/en/major-statistics/coal-reserves

huge competition from China, USA and Australia due to the unfulfilled demand of coal in the Indian market. Functioning of many coal mines have been disrupted due to land disputes, environmental clearances and economic viability. Inefficiency in coal production and transport systems implies that coal fails to reach the power stations built at a sustainable cost. In 2015, United Coal Research Centre (UCRC), UCL's research unit stated that by April 2014, the company's reserve levels were around 16%. That indicates a reduction in coal by 3.5 MT and nearly $4.25 billion in the company's share value.

Human resource problems also inhabited the center part of the problems as HR is the base for the development of any industry. As far as UCL is concerned, workforce planning and management is critical. Shortage of skilled professionals working into the dark deep tunnels and tough working conditions results in employee dissatisfaction and deterioration of personal health. The challenge the coal industry faces is hiring professionals and retaining them for a long time. Retirement of the experienced workforce has been one of the major challenges in UCL. In the last three years UCL has been recruiting about 3,000 new employees, from IITs and IIMs but as the senior executives retire, UCL is losing it's experienced employee. Quick labour turnover and absenteeism is also a major issue.

Along with these, UCL also faces challenges from trade unions and due to labour agitation. This negatively influences labour productivity and delays company growth. Many times, there have been issues related to inefficient lighting and water supply in the work places, making the laborer's life more sorrowful.

The inaccessibility of latest technological equipments with UCL for the deep depths mining of coal has been the biggest reason of low quality production. In India around 40% of the total coal reserves are situated at a deeper depths which cannot be extracted using the open cast mining equipments available with UCL, which can drill maximum up to 300 meters. Open cast mining is

largely practiced as its cheaper, safer and more user friendly than the latest technology methods. Hence the 40% of coal reserves remain unused, forcing the electric power generation companies to import coal (Singh, & Narzary, 2021).

UCL do not have an efficient assessment and evaluation mechanism of distribution of coal reserves in the country. The results and details of coal reserves shown by the technology and systems available with UCL are inappropriate due to their imperfect mining. There are some techniques of extracting coal which causes major environmental consequences. The open-cast mining technique causes irremediable damages, leaving behind an useless land. Deforestation has become uncontrolled which is retarding the ecology in the areas. Due to the infertile land and water scarcity, the displacement of people has increased. Civil unrest has also been a major reason for inefficient mining. Most of the coal reserves in India are situated in the Maoist guerrillas operated areas, making the mining environment hostile. Recently there is a considerable rise in the illegal mining and exporting of coal. So when there is major need for coal in the country, there are few people involved in malpractice like selling the coal illegally for their own selfish motives and personal gains. The litigation procedure against those guilty people goes on for years, so there hasn't been any control on the illegal mining in India yet.

UCL faces a significant logistical challenge. The company is facing constraints in shifting infrastructure and is planning to improve and consolidate its logistic management of railway rakes in order to increase the evacuation of their infrastructure by an additional 6-9 percent. They are leveraging their existing rail rakes to optimally utilize them to move large quantities of coal and exploring new possibilities to transport coal from other subsidiaries to southern regions via ports in the eastern region, primarily by leveraging multi-modal transport. The issue of railcar shortages and line congestion implies that over 50 MT of coal piles up at UCL pit heads by the end of the year.

Conclusion

Coal, the black diamond once upon a time was responsible to turn around many a countries economy as well as usher development and progress. It was the major source of energy which used to power diverse machines like locomotives, ships, and furnaces in steel plants. After India's independence, coal was a major asset and priced natural resources. Thermal power plants were dependent on coal; these plants once were the only source of electric generation. Over a period of time, many substitutes like solar, nuclear and hydel power plants started contributing electricity to the grids. UCL once a thriving coal mining company now encounters many roadblocks. These challenges are all part of the business environment in which the company exists. Now the company is moving ahead to uncertain times with both the internal and the external environment not in favour. So now it's time for UCL to take a call on how to revamp the company and take care of the environment. Additionally, steps must be taken to retain the big B2B customers and satisfy them.

Reference

Negi, B. S., Pandey, K. K., & Sehgal, N. (2017). Renewables, shale gas and gas import-striking a balance for India. Energy Procedia, 105, 3720-3726.

Lahiri-Dutt, K. (2016). Introduction to coal in India: energising the nation. In The Coal Nation (pp. 31-66). Routledge.

Rosewarne, S. (2016). The transnationalisation of the Indian coal economy and the Australian political economy: The fusion of regimes of accumulation?. Energy Policy, 99, 214-223.

Yang, X., Zhao, H., & Ho, P. (2017). Mining-induced displacement and resettlement in China: A study covering 27 villages in 6 provinces. Resources Policy, 53, 408-418.

Kumar, R., Jilte, R., Nikam, K. C., & Ahmadi, M. H. (2019). Status of carbon capture and storage in India's coal fired power plants: A critical review. Environmental Technology & Innovation, 13, 94-103.

Hewitt, C. N., & Jackson, A. V. (Eds.). (2020). Atmospheric science for environmental scientists. John Wiley & Sons.

Blondeel, M., & Van de Graaf, T. (2018). Toward a global coal mining moratorium? A comparative analysis of coal mining policies in the USA, China, India and Australia. Climatic Change, 150(1), 89-101.

Dimson, E., Marsh, P., & Staunton, M. (2017). THE CREDIT SUISSE GLOBAL INVESTMENT RETURNS YEARBOOK 2017 (2). Credit Suisse. https://www.credit-suisse.com/media/assets/corporate/docs/about-us/research/publications/credit-suisse-global-investment-returns-yearbook-2017-en.pdf.

Nair, R. J., & Daniel, F. J. (2015). INTERVIEW-India warns global charities not to work against government. U.S. https://www.reuters.com/article/india-ngo-politics-idINL3N1204TU20151001.

Kumar, A., Prakash, O., & Dube, A. (2017). A review on progress of concentrated solar power in India. Renewable and Sustainable Energy Reviews, 79, 304-307.

Soni, V., Singh, S. P., & Banwet, D. K. (2016). Sustainable coal consumption and energy production in India using life cycle costing and real options analysis. Sustainable Production and Consumption, 6, 26-37.

Li, J., & Li, Z. (2011). A causality analysis of coal consumption and economic growth for China and India. Natural Resources, 2(1), 54.

Singh, K. N., & Narzary, D. (2021). Heavy metal tolerance of bacterial isolates associated with overburden strata of an opencast coal mine of Assam (India). Environmental Science and Pollution Research, 28(44), 63111-63126.