

54	Market Assessment on Coke Industries in NE Region	NEITCO, Guwahati	2006
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Executive Summary

North Eastern Development Finance Corporation Limited (NEDFi), Guwahati vide its letter No. NEDFi/PFD/Misc/ No.126 dated 12th April 2006, entrusted North Eastern Industrial & Technical Consultancy Organization Limited (NEITCO), Guwahati to carry out a Market assessment on Coke Industries in N.E. Region. The terms of reference for the study was as under:

1. Number of coke industries presently operating in N.E. Region
2. Installed capacity in N.E. Region and Country.
3. Capacity utilization in N.E. Region and Country.
4. Demand – Present and Future projections.
5. Performance of coke industries in N.E. Region in terms of Annual production & sales, profitability etc.
6. How many of these units have availed Bank Finance & whether they are repaying the loans satisfactorily.
7. Marketing arrangements of these units, main buyers etc.
8. Impact of policy issues having a bearing on the coke industries (e.g. import from China).
9. Pollution control measures being used by these units at present – best practices in this industry.
10. Viability for setting up of more industries etc. in near future.

Carbon (directly or indirectly) has been found to be the best reducing agent for reduction of Iron Oxide to metallic iron. Carbon of suitable reactivity and physical strength was at one time produced from wood by distillation yielding wood charcoal. But, for the operation of a modern large blast furnace carbon required

for the smelting of iron ore is obtained from the destructive distillation of selected coking coal at a temperature range of 950 - 1050°C.

When coal is heated to high temperatures, in the absence of air, the complex organic molecules break down to yield gases, liquid and solid organic compound of lower molecular weight and a relatively non-volatile carbonaceous residue (coke).

Thus, coke is the residue obtained from destructive distillation of coal. Structurally it is a cellular, porous substance which is heterogeneous both in physical and chemical properties.

There are two proven processes for manufacturing metallurgical coke, both being batch processes; namely

1. Beehive Process.
2. Byproduct process.

Beehive Process: In this process, air is admitted to the coking chamber in controlled amounts for the purpose of burning the volatile products distilled off from coal which generates heat for further distillation. In this process however valuable byproduct chemicals are lost and the process causes considerable air pollution. Figure 1.1 shows a typical cross-section of this non-recovery type coke oven.

Byproduct Process: In the byproduct process/oven, air is excluded from coking chambers and the necessary heat for distillation is supplied from external source of heat, conducted through the refractory walls. The fuel used is part of the gas recovered from coking process (or in some instances, cleaned blast furnace gas or mixture of coke oven and blast furnace gas). With modern by product ovens, all the volatile products liberated during coking are recovered as gas and coal chemicals. When coke oven gas is used as fuel, about 40 to 45 percent of the gas produced is returned to the ovens for heating purposes. Coke produced in

byproduct ovens is smaller and more uniform in size as compared to beehive coke.

In North Eastern Region, Bee-Hive coke manufacturing is predominantly practiced.

India is the third largest producer of coal in the world. Coal reserve in India is 240 billion ton. Coal accounts for about 67% of total energy consumption in India. Major reserves of coal are in state of Andhra Pradesh, Chattisgarh, Jharkhand and Orissa and West-Bengal.

North East India has large reserves of coal, especially in Assam and Meghalaya. The quality of coal so far found is however, not very good as its organic Sulphur content is high (upto 3%) and carbon content is relatively low. Assam is said to contain about 1000 million tones of coal reserve, while Meghalaya also has about 1200 million tones. The first coal mining in the region was started in 1865 at the Makum coal-fields under the initiative of H.B. Medicott.

The coal reserves found in North East India belong to Gondwana, and Tertiary ages. The workable Tertiary coal deposits are found in the following two groups of geological beds:

1. Lower Tertiary deposits are found in South Garo, Khasi and Jaintia Hills and in Karbi Anglong. These deposits were laid down in the Eocene Period (Jaintia Group).
2. Middle and Upper Tertiary deposits of coal are found in Ledo-Jaipur-Naginimara area of Assam. These deposits were laid down in the Tikak Parbat Formation of Barail Group during the Oligocene Period.

Coke produced in Assam is used mainly for/by –

- (1) Small Scale Sector casting units, Ferro Alloy produces.
- (2) Domestic Sector (heating/coking).
- (3) Restaurants, Dhabas, Blacksmithy, tiny brass metal works etc.

Coke Industries Operating in North Eastern Region:

Coke Industries in Assam:

Directorate of Industries and Commerce, Govt. of Assam and offices of General Manager, District Industries & Commerce Centre, Kamrup & Tinsukia have provided a list of 49 registered coke units located in Assam. Besides these units according to unconfirmed sources, there are two units (namely M/s. Premier Coke & M/s. Prime Coke) operating in Bongaigaon District and another unit in Sonitpur District. In all around 50 – 52 units are in existence in Assam.

Coke Industries in Meghalaya:

As per information provided by Directorate of Industries and Commerce, Govt. of Meghalaya and Meghalaya State Pollution Control Board, there are 2(two) coke industries in the state of Meghalaya, both located in Jaintia Hills District. Out of the two units only one unit (M/s. Abhi Coke (P) Ltd.) is under operation. The other unit's (M/s. Jaintia Coke(P) Ltd.) implementation has been stopped by local people for fear of pollution hazards.

Coke Industries in Arunachal Pradesh:

There is 1(one) coke unit with installed capacity of 44000 MT located at Banderdewa of Papum Pare District. The product is meant for captive utilization (steel industries of the Promoters' group).

Coke units in other N.E. States:

Directorates of Industries & Commerce / State Pollution Control Boards of other states of N.E. States did not confirm existence of any coke units in their respective states.

Therefore, The total numbers of Coke Units in existence/operating in NE States works out to around 55 (fifty five).

The Installed Capacity of Coke Industries in N.E.

The total installed capacity of coke industries in North Eastern Region works out to be in the order of 1.80 million tons.

PERFORMANCE OF COKE INDUSTRIES IN N.E.

Present capacity utilization of the units is around 60 percent, which indicates present annual production of coke in N.E. Region is of the order of 1.08 million tones.

Profitability: In the context of Indian Coke Industries 26.5 Metric Tonnes of coal produces coke equivalent to about 20 Metric Tonnes. In other words input of 2 Metric Tonnes of coking coal is equivalent to 1.3 Metric Tonnes of coke output.

In case of coke units of N.E. States, however it is reported that 2 Metric Tonnes of coal is equivalent to 1.8 Metric Tonnes of coke. In such a case profit/MT of coke is higher for the units of N.E. compared to the units operating elsewhere.

RECOMMENDATION & CONCLUSION

In the light of the facts discussed in the report the viability of setting up more coke industries in N.E. Region in near future will have to be examined from the point of view of aspects mentioned below:

- 1) Present Installed Capacity.
- 2) Present Capacity Utilization.
- 3) Present Demand & future demand projections in N.E and on all India level.
- 4) Existing market specifically in N.E. region and India in general.
- 5) Techno-Economic & Commercial viability and
- 6) Environmental aspects and growing public opposition to polluting industrial activities.

By taking into account data collected during the field surveys as well as the secondary data made available by various agencies, it has been estimated that the present installed capacity of the coke industry in N.E. Region is around 1.8 million tons. The average capacity utilization of the coke units has been found to

be in the range of 60% and which translates into an annual production of 1.08 million tones of coke per annum. The present demand of coke within N.E. Region works out to 0.57 million tones, which indicates that the present actual production of coke is in far excess of local demand. The demand of coke within N.E. Region not likely to increase near future. As a matter of fact it may even as down with emphasis on wider use of non-polluting natural gas. Improved power position in near future may further reduce dependency in coal/coke in N.E. Region as fuel. The units are presently sending surplus coke produced here, outside this region, where in fact the demand for coke is steadily increasing. Therefore the existing units are not going to face any problem in marketing their products outside the state and may even have to increase capacity utilization to fulfill the market needs. The prevalent Central Transport subsidy is found to be a luring aspect for the units for sending their products outside N.E. Region.

As capacity utilization of coke units located outside the state is on decline due to stricter pollution control monitoring there is no problem for these units as such in N.E. to increase their capacity utilization to the optimum level. Apparently a few more new units may also come up in N.E. Region in future to cater to the demand of coke outside N.E. region.

Majority of the existing coke units are generally found to be techno-economically feasible and commercially viable and are making reasonable profit in the range of 16 to 20 percent. The reason for balance of 20% units not being operative is predominantly because of unsound tie-up with coal supplier(unorganized sector of Meghalaya), inter-unit conflicts, resistance from local people etc. which in most of the cases is beyond the control of an entrepreneur as well as that of Govt. agencies.

It may be mentioned here that almost all the developed countries have been gradually cutting down their dependence on coke due to their growing concern for cleaner environment. Many such countries have off late started exporting their

coking coal to developing & underdeveloped countries and importing coke in return. In India also awareness for the need of a cleaner environment is gaining ground, particularly in states outside N.E. region resulting in declining capacity utilization or closure. In N.E. States also people's resistance to polluting units already started. Considering all these aspects it may be recommended that –

- (1) Endeavour should be made to optimize the capacity utilization of the existing units rather than encouraging new units in immediate future.
- (2) New captive units may however be encouraged.
- (3) Stricter pollution control measures should be enforced in the existing units.
- (4) Users of coke should be encouraged to utilize alternative fuel e.g. natural gas, power etc. which are more environment friendly and may prove to be cheaper if appropriate technologies are used in due course.

Thus after considering all such relevant aspects as discussed in this report, it can be observed affirmatively that instead of promoting new coke manufacturing units, the existing ones should be rationalized and modernized for optimum use of the raw material i.e. coal as well as to keep the environment free from pollution as far as possible.

Besides a strict monitoring and evaluation on providing transport subsidy to the coke units must be implemented in future.