NORTH EASTERN DEVELOPMENT FINANCE CORPORATION LTD

PRE-INVESTMENT FEASIBILITY REPORT ON MANUFACTURE OF VALUE ADDED PRODUCTS BASED ON LIMESTONE AND COAL DEPOSITS IN ASSAM & MEGHALAYA

FINAL REPORT

HOLTEC CONSULTING PRIVATE LIMITED

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TITLE OF THE STUDY

MANUFACTURING OF VALUE ADDED PRODUCTS BASED ON LIMESTONE & COAL IN MEGHALAYAAND ASSAM

EXECUTIVE SUMMARY

1.1 BACKGROUND

North Eastern Development Finance Corporation (**NEDFi**) has commissioned Holtec Consulting Private Limited (**HOLTEC**) to conduct a Pre-investment Feasibility Study for the manufacture of value added products based on limestone and coal deposits in Meghalaya and Assam.

The overall study objectives broadly are as follows:

- To identify industries based on limestone and coal deposits that could be set up in the North East region keeping in mind the markets as well as the availability of raw materials and other inputs
- To conduct a pre-investment feasibility study along with evaluation of financial returns which could be possible for these industries
- To develop project profiles, which could be used by potential entrepreneurs to take investment decisions on the projects

The study commenced in December 2000 with data collection on raw materials, business and economic environment, industrial development, infrastructure, etc. As part of the data collection, HOLTEC consultants visited limestone and coal deposit sites to make a first hand assessment of the deposits. Samples of deposits were taken in order to ascertain the physical and chemical properties of the deposits.

Additionally, data was collected on Infrastructure, Markets, Supply, Investment climate, Investment levels and existing industries.

1.2 RAW MATERIALS

1.2.1 LIMESTONE

Limestone Production	• The current limestone supply is mainly from two states i.e. Assam & Maghalaya. • Supply of limestone during 1999-2000 was 10.2 lakh tonnes (5.2 lakh tonnes from Assam and 5 lakh tonnes from Meghalaya). • About 1.5 lakh tonnes of limestone were exported to Bangladesh during 1999-2000. • The supply of limestone in Assam has increased from 4.1 lakh tonnes in 1995-96 to 5.2 lakh tonnes in 1999-2000. • Limestone supply in Meghalaya has increased from 2.77 lakh tonnes in 1995-96 to 5 Lakh tonnes in 1999-2000.
Current Limestone Utilisation	• Limestone utilisation within NER has been for two industries i.e. Cement and lime. • 84 percent of limestone utilisation was in cement industry (7.3 lakh tonnes). • Lime manufacturing units utilised about 16 percent of limestone (1.4 lakh tonnes). • During 1999-2000, Assam consumed 5.63 lakh tonnes of limestone, Meghalaya consumed 3.09 lakh tonnes and balance 1.5 lakh tonnes were exported to Bangladesh. • Out of the limestone consumption in Assam, 92 percent was consumed by cement manufacturers and 8 percent for lime production. • In Meghalaya, 68 percent of limestone was utilised by cement industry and 32 percent by lime manufacturers.
Limestone Quality	The limestone deposits of the states are large with a total reserve of approximately 5000 million t. The limestone shows wide variation in quality from low to very high grade within the same deposit.
Deposits Shortlisted	The following deposits are shortlisted from the point of view of quality and infrastructure available. • New Umarangshu deposit of North Cachar Hills DistrictAssam (AMDC/AIDC block) • Lumshong deposit of Jaintia Hills District Meghalaya • Mawlong-Ishamati deposit of East Khasi Hills District ofMeghalaya • Siju limestone deposit of West Garo Hills Meghalaya.

1.2.2 COA
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Coal Production	• The coal supply during 1999-2000 in Assam and Meghalaya was 8.21 & 40.6 lakh tonnes. • The mining of coal in Assam is undertaken by North EastCoalfields (Coal India). • In Meghalaya, mostly local companies in Jaintia Hills,Garo Hills and Khasi Hills do mining. • Coal supply in Assam has not shown much increase between1995-96 to 1999-2000. • In Meghalaya, coal supply increased from 32.5 lakh tonnes in 1995-96 to 40.6 lakh tonnes in 1999-2000.
Current Coal Utilisation	• Coal from North East Coalfields (NEC) is utilised by the brick, paper & ceramic industry. • About 50 percent of coal dispatched by NEC is utilised within Assam. The balance is supplied to other states (Punjab= 26%, Haryana=12%, UP=5%). Coal mined form Meghalaya is taken to the depot at Beltola from where it is supplied within NE states and other states in the country. • Meghalaya coal is utilised by brick kilns, tea gardens, cement plants and other process industries. In many industries, this coal is blended with Bihar/Bengal coal. • Meghalaya coal is also exported to Bangladesh (about 10 lakh tonnes).
Coal Quality	The coal deposits of Assam and Meghalaya have high volatile content, a high calorific value as well as a high sulphur content.
Deposits Shortlisted	Considering the existing infrastructure facilities, quantum of exploration carried out in past, reserves potentiality, quality and environmental sensitivity following deposits are short listed; ❑ Makum coal field Tinsukia District Assam ❑ Siju – West Darranagiri coal field District West GaroHills Meghalaya.

1.3 INDUSTRIES

The industries initially considered were based on suitability from the point of raw materials and are as follows:

Limestone Based	Coal Based
Cement Lime Calcium Carbide Calcium CarbonatePaper Glass Ceramic sRubber Sugar Paints Bleaching PowderIron/Steel	Power Cement Iron/Steel Tea Bricks Coke Breeze Low Ash Metallurgical CokePaper Textiles Other Process Industries

Evaluation of industries has been done in two stages. In the first stage, shortlisting of industries for analysis has been done on weight cum rating method. The criteria used were as follows:

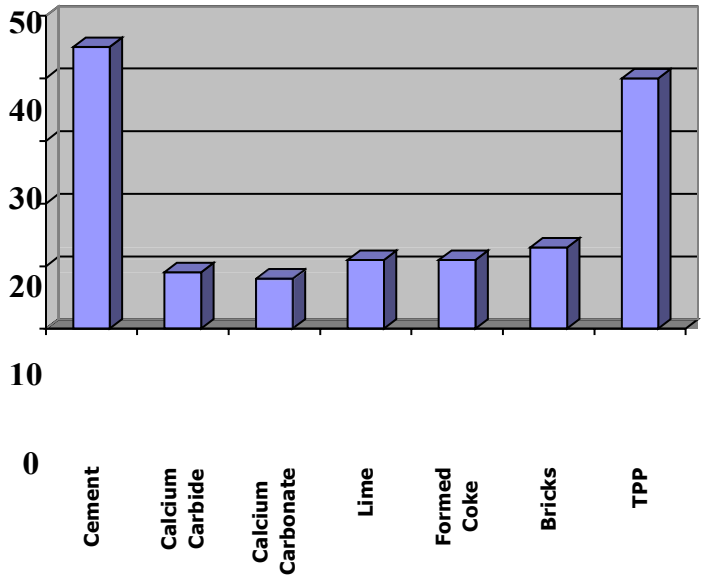
- Extent of limestone and /or coal use
- Availability of required quality/ grade
- Availability of other raw materials and inputs
- Market attractiveness
- Market competitiveness
- Scale of operation
- Level of investment
- Employment generation
- Environmental Impact

Based on weight cum rating method, the first four ranking industries based on limestone and coal respectively were selected for further analysis. These industries are:

Limestone based Industries	Coal based industries
1. Cement 2. Lime 3. Calcium Carbonate 4. Calcium Carbide	1. Power 2. Cement 3. Formed Coke 4. Bricks

The eight industries shortlisted above have been subjected to an Analytical Hierarchy Process (AHP) in order to select those industries for which pre-feasibility was taken up. AHP is a multi criteria decision making technique by which hierarchy of various alternatives is determined.

The results of the AHP are summarised in the chart given below.



The following industries, which have the highest ratings, have been taken up for pre-feasibility study:

Cement
Thermal Power Plant
Bricks

The pre-feasibility study includes information such as market attractiveness, raw materials, technology, plant location, implementation schedule and financialindicators.

The findings of the studies are summarized below.

Cement

Additional capacities would be needed to make the region self sufficient incement.

These additional capacities can be created either through expansions or through green field projects.

Besides capacity addition, possibilities of reviving the existing closed plants shouldbe considered.

The possibility of improving the capacity utilisation of existing cement plants should also be considered by way of plant modifications or assistance in marketing.

Although there is ample scope for the setting up of large cement plants in the region, investors from within and outside the region have hesitated to do so due to a law and order problem in the region.

It would be easier for the region to attract medium level investment (say in the range of Rs. 50-100 crores). A cement plant of 600 tpd capacity is therefore

recommended.

Similar sized plants can be set-up at various feasible locations in close proximity to the limestone reserves.

The possibility of setting up a split cement manufacturing units can also be explored. The clinkerisation unit could be located close to the limestone deposits and the cement-grinding unit could be located closer to attractive markets.

Besides catering to the NER market, new cement plants should also target export possibilities to Myanmar. The country imports close to 2 million t of cement. According to un-official reports, around 50,000 t of cement is supplied to Myanmar via NER through illegal means.

There has been some illegal supply of cement from the NER to Bangladesh also (about 40,000 t). The current supply of cement in Bangladesh matches the demand. The country however, imports large quantities of clinker (about 5 million t). To take care of this requirement, supplying clinker from NER could be explored.

Since drilling for oil and gas is one of the major activities in NER (Assam & Tripura), a new manufacturer should explore the possibility of producing high grade/quality OPC for this application. The market for oil well cement in NER is estimated to be around 7-8,000 t.

Keeping in mind the various technologies available, setting up a mini rotary kiln cement plant using available cement grade limestone and high volatile coal in the NER would be advisable.

Thermal Power Plant

In view of the huge investments required for a large size thermal power plant and the low chances of a private investor pumping in huge amounts of money into the region, it would be advisable to attract medium size investments. A coal based thermal power plant of 25 MW is therefore recommended for the region. Several such medium sized investments could be attracted in the vicinity of suitable coal reserves.

To begin with, it would be easy to attract investment in Assam in view of the power shortages.

The location of a 25 MW coal based thermal power plant can be near the Makum coalfields in Tinsukia District.

In Meghalaya , locating a coal based thermal power plant near Siju coal mines should be explored. Although it may not be easy to sell power from this plant within the state due to lower tariffs, the possibility of supplying this power to other NE states cannot be ruled out.

From the point of view of utilising large coal reserves in Assam and Meghalaya , it would be an ideal choice of fuel. This is also true in view of the increasing price of oil and gas which, has resulted in a higher power generation cost in the region.

To counter the high sulphur content in the coal, suitable technology would have to be chosen.

Bricks

- In order to cover the deficit in the region, there would be an additional requirement of over 100 brick plants of 50 lakh bricks/year capacity by 2005-06.
- Keeping in mind the investment levels for semi-mechanised brick plant (around Rs. 25 lakh for P&M for a 40 lakh/year production), profile of investors and the manpower available in NER, it would be easier to attract investors in the manually operated brick plants initially. Thus, a clay brick plant with a manually operated Bull Trench Kiln (BTK) with fixed chimney is recommended.

1.4 INFRASTRUCTURE

1.4.1 ROAD/RAIL

Generally, the coal and limestone deposit(s) of Assam and Meghalaya are located in rugged hilly terrain with deep valleys and gorges dissected by rivers and streams. These deposits are remotely located with dense forest cover. Most of the deposits are currently inaccessible by road. The existing infrastructure is not adequate to exploit these deposits and to establish industries based on these deposits. In order to exploit these deposits a number of infrastructure facilities need to be developed viz.:

- ❑ Widening of existing roads.
- ❑ Conversion of gravel road to metalled road.
- ❑ Construction of bridges.
- ❑ Construction of road to deposit site.

South Assam faces a major bottleneck for the movement of value added products. Cement plants located at Umrangshu are incurring high cost of transportation from the plant site to major consumption clusters. Cement manufacturers are paying freight as high as Rs4/t/km for this stretch against an average of approximately Rs 1.25/t/km in the rest of the country. Improvement of road condition as well as connecting bridges in Umrangshu needs immediate attention. Steps in this direction would help the local limestone based industry to improve access to attractive markets and lower freight costs.

Movement of limestone/coal and value added products to major towns connected by national highways in NER would face fewer bottlenecks. It is the smaller towns, connected by state roads, where transport bottlenecks are high (transportation costs vary from Rs. 3.5 to Rs.5/t/Km due to narrow & bad quality of roads).

The movement of limestone/coal and value added products by rail is possible only within Assam and quantities moving outside NE region. In the absence of a railway network in Meghalaya, the mine operators have to depend on the road infrastructure for transporting these minerals upto the nearest rail head. Over a period of time, if the products have to move outside NER, strengthening of existing railway network is necessary. Availability of wagons for transporting these products also needs improvement.

The possibilities of transporting limestone by other mean such as ropeway/belt conveyor/ tube conveyor was also explored. Potential for such modes of

transportation was found in Shella & Siju limestone deposits in Meghalaya. However, the mode of transport by alternatives modes can only be considered after detailed topographic survey. This study shall form part of detailed project study after finalisation of project and plant site. Transportation of coal in Meghalaya by modes other than road may not be feasible due to the low production capacity of individual mines (due to small thickness of coal seam).

1.4.2 POWER

The power situation in Assam is the worst amongst NE states. Existing generation capacities by ASEB are operating at very low plant load factors (PLF). Cement, one of the prominent limestone based industries in the state, is suffering due to shortage of power. Companies located in Umrangshu suffer from production loss due to power shortage in the region. Improving power situation in the state should be given top priority by the state government. In view of scarcity of funds with state agencies, private investment in this area should be encouraged.

Meghalaya is the only power surplus state in the region. In addition to meeting its own requirement, Meghalaya supplies power to other states in the region. Due to hydel power generation, tariff is low. The surplus power situation and low tariff has attracted many private investors to set up industries in the state. In view of increasing investment, particularly in power intensive units, the demand for power in the state has increased significantly. Keeping in view the increasing demand for power in the region, the state may not be in a position to meet the demand completely in the future. To utilise large coal reserves in Meghalaya, the possibility of coal based thermal power should be explored. Although, power generation cost in this case would be higher than the existing hydel power generation, the possibility of selling this power to adjoining states should not be ruled out.

1.4.3 LAND

For setting up industry in Assam, land can be obtained from the government or private owners. As per land regulations in the state, transfer of land in plain areasto private investors (from within or outside) is possible except for designated areas within the tribal belts and blocks. For hill districts of Assam, (Karbi Anglong & North Cachar), transfer of land to non-tribal and outsiders is possible only after prior permission of EC of the District Councils. For setting up industries based on limestone & coal, proximity to these minerals becomes a major consideration. Potential areas for locating coal based industries are in upper Assam (Dibrugarh/Tinsukia) and for limestone based industry, are south Assam (Umarangshu). Investors acquiring land in upper Assam would not face any problem but for locating industry in Karbi Anglong & North Cachar, prior permissionswould be required. The state needs to make certain provisions in the land regulations so as to simplify land acquisition procedures in these hill districts.

The majority of land in Meghalaya is privately owned, either by individuals or by the village community. Besides, the government also provides land for setting up industries in state owned industrial estates or growth centres. As per Meghalaya Transfer of Land (Regulation) Act 1972, transfer of land to non-tribal and outsiders is prohibited. Investors from outside the state, wanting to acquire private land, find their way around this requirement by making the land owner a shareholder in the company. For attracting investments in limestone & coal based industry in the state, the land transfer act needs to be reviewed.

1.4.4
INVESTMENT CLIMATE

As far as limestone/coal based products are concerned, investments have mainly come from the state governments and small/medium sized local private companies. Very few investors have been attracted in coal based industries. Although, many large companies (Indian/Foreign) in the past have explored the possibility of setting up limestone/coal based industries in the region, none have gone ahead with implementation. The following reasons could be attributed to such decisions.

- ⇨ Law and order problem of the region
- ⇨ Limited market size within the region.
- ⇨ Transport bottlenecks resulting in lack of access to markets outside the region.
- ⇨ Complex land tenure systems.
- ⇨ Lack of reliable skilled labour.
- ⇨ Power shortage in certain pockets.
- ⇨ Lack of ancillary/auxiliary industries in the region to support the main industry.

To attract investors in the region, both the Central and State Governments provide incentives such as excise/sales tax exemption, income tax holiday and transport subsidy. However, providing these incentives alone have not yielded good results for the region. It would be necessary to couple these incentives with creating the right atmosphere for the industries. Lot of stress and importance needs to be given to build confidence in the minds of investors. This could be done by taking following steps;

- ⇨ Organizing regional/national/international conferences where investors get an opportunity to know more about the region and clear doubts/myths about this region. Federation of Industries in NER recently took a step in this direction.
- ⇨ Frequent participation of local bodies in national/international trade shows with a purpose to promote investments in the region.
- ⇨ In mineral based industry, the region will gain substantially, if a well known large company (Indian/Foreign) is attracted to invest in the region. By doing so, the confidence of other investors wanting to set up industries in this region would get a big boost.