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**INNOVATIVE INHERENT ASSET VALUATION RESEARCH STUDY**

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**ABSTRACT**

This research study was carried out on the assignment from associates, working for Government of India. Regarding coal deposits at the coal concession of Pt Guang Alam Semesta (“GAS”), Indonesia, Videocon had provided security to IDBI inter-alia in the form of pledge over 51.33% shares in the Indonesian Company having IUP(Exploration) permit for a coal concession area spread over 10,000 Ha in Katingan Regency, Central Kalimantan, Indonesia. S K Ahuja Associates, an established valuer in India and is on the panel of approved valuers of IDBI. M/s Videocon (Mauritius) Infrastructure Ventures Limited. Videocon had approached S. K. Ahuja for carrying out an assessment of the Inherent Asset Value of coal resource available at the coal concession of GAS in Indonesia based on its independent assessment, site visit and review of certain survey reports. As Director, Project & Environment Consultants as well as researcher, the author was assigned the work to examine possibility viable mining and import to India.

**KEYWORDS:** Exploration Data; Inherent Asset; Approved Valuer; Assessment; Geo-technical Planning; Research Estimates.

**1.INTRODUCTION**

Primary consideration should be given to the likely mine planning implications arising from geo-technical interpretation. Coal is the world’s fewest abundant and widely distributed fossil fuel. It is a global industry that makes a significant economic contribution to the global economy. Coal is mined commercially in more than 50 countries and used in more than 70 nations. An assessment of the Inherent Asset Value of coal resource available at the coal

concession of GAS in Indonesia based on its independent assessment, site visit and review of certain survey reports submitted by various surveyors and consultants. The list of the reports provided by Videocon were given to the Researcher.

The valuation report is based on the survey reports forwarded by VIDEOCON and the prevailing international rate of Coal. This is an opinion without prejudice to findings by other sources. the coal would remain the most dominant fossil fuel given the availability, ease of exploration & production coupled with ease of transport. The Integrated Energy Policy for India prepared by the Planning Commission envisages that coal shall remain the predominant source of energy for India in foreseeable future. Some research estimates that more than 90% of the estimated 3.5 billion metric ton coal demand growth in Asia is expected to come from Indonesia in the next 20 years.

## 2. VALUATION APPROACH

International Mining Standards (Mine Valuation)being followed now are 1) Australia (The Valmin Code, 2005); 2) Canada (CIMVal, 2004); 3) South Africa (SamVal, 2008); 4) USA (USPAP); 5) International Valuation Standards IVS (June, 2010); 6) Royal institution of Chartered Surveyors (RICS-2011). Final approach will be decided on further investigations.

A significant proportion of coal transport in Indonesia is water based, which allows for coal to be transported along rivers via barges to the open sea for loading on to larger vessels. Production, exports and domestic sales are estimated to increase by at least ten percent annually over the next five years. Coal has a clear importance for Indonesia's state revenue as the commodity accounts for around 85 percent of mining revenue.

However, with increasing numbers of coal fired power plant being under installation to meet increasing power demand, the domestic consumption is likely to increase in near future which in turn might bring in regulations for export besides increased cost of production due to incidence of higher royalty. The thermal coal available in this country generally covers Lignite, Bituminous and Sub-Bituminous with “as received” heat content ranging from 3500 Kcal/Kg to 6100 Kcal/Kg. The Bituminous and higher heat content Sub-Bituminous variety of coal are generally exported while low heat content coal are consumed domestically.

In medium to long term, with global economic activity back on track, demand from Emerging and Developing Markets like China, India and other African economies would grow. Considering the rising energy prices and growing scarcity of energy sources, it will become

more expensive to buy coal on the market in the future. These promising perspectives are the main reason that investment in securing coal reserves in Indonesia augurs well for future.

### 3. ANALYSIS OF REPORTS

Based on a detailed evaluation of the reports provided by VIDEOCON following aspects had to be examined:

- 1) Exploration Data,
- 2) Logistics
- 3) Marketability of the coal.

In order to arrive at a reasonable asset value, database on recent M&A activities, announcements made in various stock exchanges by coal companies operating in Indonesia have been relied upon. In determining the market value of the asset, we have relied on reports and feed-backs of reputed third party service providers such PT. Britmino and PT DMT and for logistics we have relied upon report of M/s Sea Bulk System Inc, Germany & M/s Altus Trading Limited, Singapore. Our opinion has been based on logical presumption regarding coal resource, the logistics for market accessibility and the most significantly marketability of the mineral deposit. Our findings are supported by the physical site visit done by us to the coal concession of GAS in Indonesia.

### 4. BRIEF ON PT GAUNG ALAM SEMESTA (GAS)

Administratively, it is located in Katingan Tengah and Pulau Malan Sub-District, Katingan Regency, Central Kalimantan Province. Mining Business Permit (IUP) for Exploration in the area of 10,000 Ha has been granted to PT. GAUNG ALAM SEMESTA by Katingan Regency Government. Videocon Industries Limited holds 51.33% equity through its overseas affiliates in PT Gaung Alam Semesta (“GAS”). GAS was allotted an Izin Usaha Pertambangan Explorasi (IUP Exploration) in Katingan Regency of Central Kalimantan Province of Indonesia. This IUP has been issued by Bupati (Regent) vide Nomor: 540/165/KPTS/V/2012 dated 21<sup>st</sup> May 2012. It covers an area of 10,000 Ha. GAS has also obtained Forest Clearance (Pinjam Pakai) for the entire forest area of this concession. Based on the company’s satellite imagery and field observation, the investigation area consist of secondary forest (25%), plantation (5%), open area (55%) and swampy area (15%).

The rivers in the investigation area are Kelanaman River and its tributaries. Main Kelanaman rivers flows northwest to southeast, while its tributaries flow from northeast to southwest in

the north and southwest to northeast in the south. These rivers are utilized by the local community for necessities of life. The source of surface water is rainfall, so if the rainfall rate is high then the surface water will be available in ample quantity calling for water control management.

## 5. GEOLOGICAL COAL RESOURCE

The majority of mineral assets valuations will be based on income approach thus requiring construction of comprehensive financial models reflecting a wide array of parameters from areas of geology, mining, environmental studies, finance, marketing and politics to name the most important ones. Harmonization of valuation methods and approaches limiting unnecessary redundancies and eliminating different usage.

Classification of Valuation Approaches and Methods- DCF Conventional Method · DCF + Monte Carlo · DCF + Probabilistic Factors · Real Options Method Cost Approach · Modified Appraised Value · Multiple of Exploration Expenditure (MEE) Market Approach · Comparable Transactions Method · Option Agreement Terms Method · Value per unit area Method · Net Metal Value or Value per unit of metal Method.

Based on Regional Geology Map of Tewah (Kualakurun) Sheet, Kalimantan (A. S. Sumartadipura and U. Margono; 1996), geology of investigation area of Mining Business Permit of PT. GAUNG ALAM SEMESTA fall into Dahor Formation (95%) and Alluvium (5%). Various reports submitted for evaluation, indicate that the Geological Mapping of the entire area of 10,000 Ha has been carried out. Extensive drilling of highly prospective area of about 4642 Ha based on Geological Mapping has been done . About 327 boreholes have been drilled, 380 coal core samples have been collected and about 501 various test results have been collected from the laboratories of PT Sucofindo. PT Britmind, a reputed Geological Consulting agency in Indonesia, was engaged to evaluate the exploration data and prepare Geological Resource and Reserve statement for GAS. PT Britmind has assessed (January, 2011) a total Geological Resource as presented in Table- 1 below.

**TABLE- 1: Geological Resource in the Explored Area Of “Gas”**

<b>Coal Resource</b>	<b>Reserve</b>
Measured Category	361 Mt
Indicated Category	68 Mt
Inferred Category	69 Mt
<b>Total Coal Resource in “GAS”</b>	<b>498 Mt</b>

This assessment has been vetted by another International Geological consultant PT DMT that has been engaged by GAS to prepare further drilling program for GAS coal concession. Both reports prepared by PT Britmindio and PT DMT have been studied and it is inferred that the findings are by and large in agreement. There is an indication of presence of 50 Mt to 100 Mt of additional coal resources in this area which is yet to be explored. This information does not form a part of Asset valuation.

**6.ASSESSMENT OF INHERENT VALUE**

Inherent value of an Asset is a function of the Resource of Coal and market rate assigned to each tonne of coal resource. Coal Resource is derived from the Geological Exploration Report and the confidence level on such coal resource. The market value is derived keeping in consideration the benchmarks set by recent market transactions. As no two coal concessions are similar, the market value also needs to be adjusted to make the valuation basis comparable. The resource in Measured category is assigned highest confidence while those in Indicated and Inferred category are assigned lower levels of confidence in descending order. The resource is accordingly discounted as shown in Table-2 below.

**TABLE- 2: Discounted Resource Based on Confidence Level.**

<b>Resource Category</b>	<b>Confidence Level</b>	<b>Resource</b>	<b>Discounted Resource</b>
Measured Resource	100%	361Mt	361 Mt
Indicated Resource	70%	68 Mt	47.6Mt
Inferred Resource	55%	69 Mt	38 Mt
		498 Mt	447 Mt

(Based on quality of coal, different basic values are assigned to Indonesian Coal)

Resource. These numbers are derived based on data on recent M&A transactions that have taken place in Indonesia. The basic Inherent Value of similar quality of coal has been found to be in the range as given Table-3 below.

**TABLE- 3: Basic Inherent Value of the Asset of Similar Quality.**

**(Based On Recent M&A)**

<b>Gross Calorific Value of Coal (K Cal / Kg) on As Received basis*</b>	<b>Basic Inherent Value of the Asset on USD per tonne of coal resource</b>
3500 to 4000	1-2

The Mining costs are also impacted by stripping ratios which is basically relative depth of deposit measured as quotient of Tons of Over-burden to Tons of Coal while the transportation costs would be represented by length of Haul Road, Barging distance and draft

of the river which impacts the size of the barges that can be used. In the case of GAS, the Haul Road length is about 100 km. The barging distance is 90 nm and a year-round draft of 4.5m is available ensuring viability of barges of 6000t to 8000t to operate.

Though the Inherent Value of the Asset can be adopted as US\$ 1.4/t of coal based on data available in the internet but a discounted factor of 10% has also been applied in order to arrive at a conservative but realistic Inherent Value of the Asset. The fixed carbon content which has a direct relation with the calorific value varies between 22.6% and 78%. The Basic Inherent Value needs to be discounted based on the operating costs and the transportation costs which depends on logistics and type of mining like open cast, tunnel-underground etc. As more mining companies develop sustainable development programs, the insight provided by Life Cycle Assessment will be invaluable to management. The resource estimated by Britmino corresponds to a stripping ratio of 1: 5. Accordingly, the Inherent Asset Value has been arrived at as shown in Table-4.

**TABLE-4: Discounted Inherent Asset Value.**

<b>I No</b>	<b>Particulars</b>	<b>Units</b>	<b>Value</b>
1	Discounted Resource (refer table-2)	Million Tonne	447
2	Normal average asset value based on recent M&A data	US\$/te	1.4
3	Discounted factor in value	%	10
4	Discounted Inherent Asset value (Sl no. 2*Sl no.3)	US\$/te	1.26
5	Derived Inherent Asset Value for (for about 4700 hectares out of total 10,000 hectares) GAS. (Sl no.1 multiplied by Sl no.4)	US\$ millions	563

## 7. CONCLUSIONS

Strategic Mine Planning aims at capturing maximum potential value from the exploitation of an ore deposit on an annual time scale, generally expressible in Net Present Value (NPV). Tactical Mine Planning aims at ensuring viability and sustainability of the strategic planning at an operational level on monthly or even weekly scales.

Having carefully considered the information provided to us by Videocon Group and the reports of third party independent experts and based on detailed evaluation of the GAS coal concession, it is opined that Inherent Asset Value would be about USD 563 million wherein the share of Videocon's stake of 51.33% is valued at about USD 289 million. This report does not consider coal potential with respect to remaining 5300 Hectare area which according to our opinion yet to be explored.

The report prepared by us is an opinion without prejudice to findings by others which may be different and for such differences we are not liable. The author had to consult reports of PT Britmind, Indonesia, PT DMT Exploration Engineering Consulting Indonesia, M/s Ground Risk Management, Jakarta, Indonesia, Mr Wisnu Malela, Head Geology, PT Gaung Alam Semesta, M/s Sea Bulk Systems Inc, Vancouver, Canada, PT Andhika Lines, Jakarta, PT Surtech Utama Indonesia, M/s Altus Trading Limited, Singapore.

Risks that even if a commercially viable deposit is present, political, environmental and social factors may make the discovery and development of the mineral resource unviable. A change in government which may be unfavourable to the development of mineral resources prospect that a proposed future mining development may be deemed too environmentally damaging to proceed, meaning that a mining, as opposed to an exploration license, may not be granted; changes in tax and other financial conditions subsequent to the conditions which were legally in place at the start of exploration; and natural disasters such as volcanoes, earthquakes, floods etc. As government of country is commercially conducive to attract investment and ready to come forward to protect the interest of the investors unless a political upheaval upturns the system which is far flung. Inherent Asset value: USD Million 563 to 548 average from the studies of various companies involved.

Optimization is a continuous and data-driven endeavour for mining projects, which materializes when maximum profitability is achieved across the value chain. The measures for an optimized operation frequently change with an update of information on resource properties and market initiatives, which ultimately determine the expansion or contraction of mining projects. Monte Carlo simulation and real options valuation methodologies has put the valuation of mining industries based on actual data assembled is more appreciated.

Real Options Valuation With Binomial Lattice Model- ROV approach is a modern methodology of strategic managerial options for economic evaluation of certain projects under uncertainty and management's flexibility in exercising or abandoning these options at different points in time

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