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Impact of Green Reporting for Business Valuation: Study of Rubber Manufacturing SME in Sri Lanka

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Abstract

Key economic players of Small and Medium Scale Industries are eager to provide final products to meet the market demand. But they are not considering the environmental impact on the manufacturing process. This has resulted in climate change which led to global warming. Several researches have been carried out in this regard and mitigation measures have been introduced, but there is not a semblance of implementation of measures in minimization global disposition through green reporting of carbon dioxide emission level. Hence, this research has been carried out considering how green reposting can lead to derive fair business valuation, by doing a case study in the sphere of rubber manufacture. This case study is carried out by applying the net asset value method. Findings have revealed that, energy consumption is associated at the rubber mill itself and emissions connected to productivity of kW/H of energy consumption and emissions from the production of rubber band amounting 1.67 ton CO_2-eq/ton product. There is a vital finding from this research — mainly there is no record of environmental impact due to manufacturing process to derive fair business valuation—. Any business valuer could directly benefit from these findings in order to derive fair business valuation methods of price to earnings ratio, net asset value and net present value through green reporting to minimize global warming potential. Also policy makers can develop processes to promote the green reporting as a mandatory requirement for business valuation.

Keywords: Business Valuation, Green Reporting, Energy-Efficiency

Introduction

Climate change presents considerable risks to all countries with as exception and steps taken to minimize in the future. Companies were able to gain a competitive advantage via improved energy efficiency, reduced waste, increased recycling, improved quality, better environmental credentials, greater customer satisfaction, new business opportunities, gaining local community support, gaining increased staff commitment, positive pressure group relations, improved media coverage or a combination of these benefits. Owing to their small size, SMEs may be adoptable enough to move quickly to offer "greener" products in order to appeal to consumers who are increasingly concerned with environmental or social issues. Greenhouse gas (GHG) emissions mainly consists of Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydro Flouro Carbon and per Fluorocarbons (HFCs, PFCs) respectively as well as Sulphur Hexafluoride (SF_6) emissions from manufacturing process reactions, distributions and treatment processes (Verfaillie and Bidwell, 2000 cited by Shi *et.al*, 2012). Nelson *et.al*, (2011) stated that, most businesses do not produce material quantities of GHG emissions and nearly all businesses will experience increases in the costs of core input commodities that are greenhouse intensive. For businesses with high-energy intensity, their energy productivity measures can be a major indicator for its competitive advantage. Companies selling goods and services that promise customers improved energy efficiency will also increase market

share (Shi *et.al*, 2012). The energy wastage may be due to inappropriate design of facilities and processes, or due to an excessive number of management defects (Tsoulfas and Pappis, 2006 cited by Shi *et.al*, 2012)

According to Brenton *et.al*, (2009) concern about climate change has stimulated interest in estimating the total amount of carbon emitted during production, processing and distribution of a product. The final outcome of this exercise is called the product's 'carbon footprint' and the exercise itself is known as 'carbon accounting'. Methods are already established for measuring, reporting and verifying carbon emitted during production process. One scientific method typically applied is Life Cycle Analysis (LCA). As cited by Dayaratne and Gunawardana (2014), Nelson *et al*. (2011) stated that, accurate and comparable emissions data are critical in assessing the financial impacts on industries and companies, due to the introduction of an emission trading scheme or carbon tax. It is imperative to appraise how policies and designed to price GHG emissions as a negative externality, should be considered in any analysis of individual business profitability.

Business Valuation

A business is a legal entity that is set-up or designed to make goods, sell goods, or provides a service. Many businesses are for-profit organizations as opposed to a non-profit organization or as a hobby or leisure time job. How an organization is structured affects how a business is run, how it is taxed, and how profits are distributed. The actual business structure can also affect the personal liability of any owner of the business. In business valuation, a valuation takes place for an operational business enterprise or a going concern.

Business valuation is a process and a set of procedures are used to estimate the economic value of an owner's interest in a business. Valuation is used by financial market participants to determine the price they are willing to pay or receive to perfect a sale of a business. In addition to estimating the selling price of a business, the same valuation tools are often used by business appraisers to resolve disputes related to estate and gift taxation, divorce litigation, allocate business purchase price among business assets, establish a formula for estimating the value of partners' ownership interest for buy-sell agreements, and many other business and legal purposes. Major factors affecting the valuation in sequence are (i) availability of adequate financial information, (ii) line of business, (iii) market location, (iv) quality and depth of management, (v) size of business, (vi) volume of trade and (vii) terms of sale

Price Earning Method

$$\text{P/E Ratio} = \frac{\text{Price}}{\text{Earnings}}$$

The above formula reflects the price to earning ration. This is, derived price divided by the earnings of an institution.

Net Asset Value Method

The net asset value (NAV) formula is used to calculate a mutual fund's value per share. A mutual fund is a pool of investments that are divided into shares to be purchased by investors. Each share contains a weighted portion of each investment in the collective pool. The premise of grouping in this manner is to minimize risk by diversifying.

It is important to note that the net asset value does not look at future dividends and growth as do other stock and bond valuation methods. The formula for net asset value only looks at the funds per share value based on its net assets.

The net asset value is determined by the mutual fund company and priced according to this formula. Stock and bond valuation methods are not used due to mutual funds being sold directly from the company and not through an exchange or on the secondary market. Stocks, on the other hand, are sold through bid and ask pricing on the secondary market which requires an investor to determine a share's value to them based on expected future earnings, in which they bid accordingly. The calculation of NAV is given below.

Value = Fixed Assets	= Lands
	= Buildings
	= Plant & Machinery
	=Furniture / Equipment Tools
	= Vehicles
ADD: Current Assets	= Stocks
	= Finished Goods
	= Goods in Transit
	= Spares
	= Receivables/ Debts
	= Brand/Parents
LESS: Current Liabilities	= Payment Due
	= Creditors
	= Tax Liabilities
	= Bank Overdraft
ADD: Long Term Investments	= Shares in Other Companies
	= Fixed Deposits
	= Treasury Bills
LESS: Long Term Liabilities	= Provision for Gratuities

Net Present Value Rule

As already mentioned, the net present value (NPV) method is representative of the dynamic investment appraisal and a discounted cash flow method. The basis for the net present value method is the assumption that one euro today is worth more than one euro would be worth tomorrow. The reason for this is quite simple. Today's euro can be invested and generate interest. This is the inclusion of the net present value method. The profitability will be assessed by examining the return on the invested capital that is achieved under the assumption of a discount rate. All investments, whose net present value is zero, achieve the same return as the alternative investment. If it is greater than zero, in comparison to alternative investment, achieve a capital increase; is less than zero, it achieves a worse return than the alternative investment and the capital expenditure may not be recovered. The net present value method is suitable for both the assessment of new investments as well as the comparison of investment alternatives. The investment with the higher net present value is the more favourable alternative. Because it is an additive process, the net present values of different investments with different discount rates, which are not mutually exclusive, can be added up. The net present value is derived by adding all the discounted cash flows minus investment expenditure. The calculation of NPV is given below.

Value	Net Present Value of Future Earnings
ADD:	Non Performing Assets
	Adjusted Net Current Assets
	Long Term Investment
LESS:	Long Term Liabilities

	Total gross Turn Over
LESS:	Business Turnover Tax/ Sales Tax/ Turnover Levy
	Net Turnover
LESS:	Cost of Sales
	Gross Operating Profits
LESS:	Operating Expenses (Depreciation Included)
	Net Operating Profit
ADD:	Other Income
	Net Income before Tax
LESS:	Tax
	Net Profit after Tax
ADD:	Non Cash Charges (Depreciation)
LESS:	Capital Expenditure
LESS:	Increase in Working Capital X Discounting Factor
	= Discounted Cash Flow = NPV
	Net Cash Flow

Problem Statement

Several carbon footprint minimization measures have been developed to apply during the production process and unfortunately, methodologies such as green reporting is yet to be formalized implementation to derive business valuation. As a result, this research is focused on "*how green reporting can be culminated with business valuation"* with special reference to the availability of adequate financial information related to energy-efficiency in order to derive business valuation measures in Small and Medium Scale Enterprises in Sri Lanka?" In the course of this critical study, it was realized that implementation of strategies should be a collaboration of all the stakeholders since the ultimate beneficiary is the community at large that embodies all the stakeholders. The process of this research is manifestly based on a comprehensive representative sample of the rubber products manufacturing SMEs in Sri Lanka and its current contribution for minimizing emission of carbon footprint through their energy efficiency.

National green reporting system

National green reporting system (NGRS) of Sri Lanka was developed by the Ministry of Environment with the Public Private partnership to fulfill the requirement of the mission 9 (greening the industries) of the Haritha Lanka National Action Plan. This is administrated by National Council for Sustainable Development chaired by H.E the President and the Ministry of Environment functions as its secretariat. One of the main focus areas relating to business valuation can be derived from contribution to the green economy through further emphasis on inputs and outputs rather than expenses and revenue. Such initiative improves public value of the organization.

Literature Review and Theoretical Framework

Small and Medium Scale Enterprises

Small and medium scale enterprises (SMEs) play a vital role in the developing economies by way of contributing to the national economic output. Also in the form of generating potential employment and this sector is considered as engine for economic growth and development (Thiruchelvam et.al, 2003 and Singh et.al, 2010). There is no international agreement on a definition for the term 'Small and Medium sized Enterprises' (National Strategy for Small & Medium Industries Development in Sri Lanka, 2002; OECD, 2009).

Agan et.al, (2013) stated that, climate change and environmental pollution have become a cause of universal concern. Companies, both large and small, are contributing to environmental, pollution by emitting waste as gas, liquid and solid forms. It is widely accepted that, SMEs are responsible for seventy percent of all industrial pollution (Hillary, 1995 cited by Agan et.al, 2013). The fact that on the average, a manufacturer spends more than 60 percent of his income on materials and services (Krajewski et.al, 2010 and cited by Agan et.al, 2013) confirm that SMEs produce a large and usually polluting share of finished products.

Energy usage in rubber manufacturing process

Dayaratne and Gunawardana (2014) stated that, during all the stages in the manufacturing processes of rubber products, it consumes a high quantity of energy, water and other natural resources. It being the ever-booming industry, rubber will count as a carbon emitting product which cannot be evaded though the latex is drawn from rubber tree. Therefore it is absolutely necessary to identify carbon footprint mitigating measures to ensure sustainable business in practice on a commercial scale. Enormous potential exists for cost-effective improvements in the existing energy-using equipment. Also, application of good housekeeping measures could result in appreciable savings of energy by the parties concerned in respective governments and especially, at plant level in the industries.

Table 1 - Type of Energy Use in Rubber Product Manufacturing

Industry Division	Rubber Products (more than 25 persons engaged factory)	Rubber & Plastic (less than 25 persons engaged factory)
Fuel & Electricity	4,813,983,284	353,138,433
Electricity (Rs.)	2,614,359,207	260,424,778
Furnace (Rs.)	896,085,259	15,619,075
Diesel (Rs.)	314,977,700	24,944,532
Kerosene (Rs.)	52,972,080	737,867
Petrol (Rs.)	47,850,814	4,534,100
L.P.G. (Rs.)	20,530,227	37,888,271
Charcoal (Rs.)	208,096,259	14,600
Firewood (Rs.)	452,702,089	3,661,274
Water (Rs.)	190,168,153	3,536,752
Other fuel (Rs.)	16,241,497	1,777,183

Source: Annual Industry Survey 2011

Green reporting initiative

The Coalition for Environmentally Responsible Economies (CERES) in partnership with the United Nations Environmental Programme (UNEP) created the Global Reporting Initiative (GRI) in 1997. The mission of the GRI is to develop and disseminate guidelines for organizations to report their environmental, economic and social initiatives in order to increase private sector transparency (Tuttle et.al, 2008).

Attitude of factory owner/management

Lack of awareness of the impact of carbon footprint by the owners and managers has led to increase the gravity of this problem. There is an increase in pollution from oil consumption in Sri Lanka, though fuel wood use is important in the industries (Thiruchelvam et.al, 2003). A knowledge of the concept of "carbon footprint" is good (Tuttle et.al, 2008) for the owners and management.

There who adopt environmental management systems are more likely to rely on their complementary knowledge-based capabilities towards working with their network of suppliers to minimise system-wide environmental impacts (Darnall et al, 2008 as cited by Shi et.al 2012).

Systematic green management (Lee, 2009 cited by Lee et.al, 2012), helps enhancing operational efficiencies as cited by Lee et.al, (2012). Therefore awareness of the need for ecologically responsible practices and production is a priority. Peattie (1995) and Welford (2000) cited by Manaktola & Jauhari, (2007) define it as the management process responsible for identifying, anticipating and satisfying the requirements of customers and society, in a profitable and sustainable way.

A company should have a clear environmental policy to guide their environmental developments which include the guideline; such a policy also demonstrates determination to embrace environmental sustainability. An environmental policy is top management's declaration of its commitment to the environment. This policy presents a unifying vision of environmental concern of the entire company, and serves as the foundation of environmental management (Maxwell et.al, 1997; Savely et.al, 2007 cited by Hsieh, 2012).

A firm creates value when its management privileges sustainability is rather than a mere product Performance (Ciasullo et.al, 2012). A vision of "ecological sustainability" is advocated by which the challenge for firms is to move beyond pollution control or prevention and to operate within the carrying capacity of ecosystems by minimizing resource use and their ecological footprint (Hart, 1995; Sharma, 2003 cited by Ciasullo et.al, (2012).

Owners/managers of SME are usually less motivated and interested in sharing or collecting information on energy-efficient environmentally-sound technologies (E^3ST), whom to contact, where to get the required financial and technical help, government policies and initiatives on E^3ST, etc. Many owners of the SME have little or no formal education or training and the limitations and maintenance requirements of the E^3ST equipment installed are not well understood. Such a situation could easily lead to equipment malfunction (Thiruchelvam et.al, 2003). Less knowledge on certification to International Standards Organization (ISO) 14001 (Gallup & Marcotte, 2004 ; Sarkis, 2001 cited by Shi et.al, 2012), other voluntary environmental management standards cross functional collaboration, and this knowledge for intra-functional cooperation may have a synergistic effect for firms and facilitate inter-OEPs concerning eco-design. Environmental performance is a concern of managers due to reasons ranging from regulations, contractual compliance, public perception, and competitive advantage (Theyel, 2001 cited by Shi et.al, 2012). Environmental Pollution Prevention Project (EP^3) conducted train-the-trainer courses in many countries to help develop local capacity to provide training in pollution prevention.

Energy-efficiency

At the global level, people have adopted patterns of the use of materials and energy that are simply unsustainable. The amounts of materials and energy we are consuming are such that people are rapidly depleting the world's available resources. At the same time, this consumption is leading to

increases in waste and pollution which, in quantity as well as in toxicity, are overwhelming the assimilative capacity of the world's ecosystem and most developed countries are consuming far beyond these needs. ISO has just started the development of a new standard – ISO 50000 – in the field of energy management. A number of countries have imposed energy-efficiency requirements for products for at least a decade (UNIDO, 2010).

In the Latin American context, the environmental leaders among countries with comparable incomes and the industrial sector have achieved decreased environmental impact (Martínez, 2010). SME are still reluctant to adapt energy efficient environmentally-sound technologies due to their inherent characteristics and resistance to change (Thiruchelvam et.al, 2003). Research and Development (R&D) to improve energy efficiency and reduce pollution is mostly neglected especially in the SME sector. This sector also cannot afford expensive R&D and pay for technology transfers (Narayanaswamy & Scott, 2001 cited by Thiruchelvam *et.al*, 2003). Current energy policies of China, India, the Philippines and Sri Lanka promote R&D to develop indigenous energy efficient technologies (Yakowitz, 1992; Visvanathan & Kumar, 1999 cited by Thiruchelvam *et.al*, 2003). The Green New Deal Group of UK suggested executing a bold new vision for a low carbon energy system that will include making 'every building a power station' by maximizing their energy efficiency and potential to generate renewable electricity (The Green Economy Paper One, RIO, 2012).

Many renewable energy sources such as wind power, solar, hydro, bio-based power are becoming more prices competitive against the traditional fossil fuels as the changing energy market structure has created new competitive pressures (Shi et.al, 2012).

For businesses with high-energy intensity, its energy productivity measure can be a major indicator for its competitive advantage. Companies selling goods and services that promise customers improved energy efficiency will also increase market share (Shi *et.al*, 2012). The wastage of energy may be due to inappropriate design of facilities and processes, or due to an excessive number of management defects (Tsoulfas & Pappis, 2006 cited by Shi *et.al*, 2012)

Regulatory greening refers to environmental and social improvements by mandatory requirement and compliance. However, this has only recently affected the commercial real estate industry in the UK and Europe, with the introduction of schemes like the EU energy efficiency mandatory disclosures for commercial real estate (Warren-Myers, 2012).

The concept of Clean Energy (CE) should be promoted in the South Asian countries not only to resolve the waste issue but also to conserve its natural resources. Examples are countries like Japan, China and Korea are moving forward successfully in this concept. The theme of the CE concept is the exchange of materials where one facility's waste, including energy, water, materials, as well as information, is another facility's input. The new term that is also used widely is the 'Eco-Industrial Cluster' or Industrial Symbiosis (Visvanathan & Tenzin, 2006).

An organisation's internal Environmental Management System requires conducting internal environmental auditing to reduce energy International environmental voluntary standards such as ISO 14001 requiring cross-functional collaboration, and this knowledge for intra-functional cooperation may have a synergistic effect for firms and facilitate inter-OEPs concerning eco-design (Theyel, 2001 cited by Shi *et.al*, 2012). By planting and preserving trees all around it benefits saving energy (Pivo, 2008). The EC has designed a scheme to ensure that the use of bio-fuels have climate change benefits. By 2020, it proposes that 20% of overall energy consumption should come from

renewable energy, while 10% of fuels used for transport should come from bio-fuels (Brenton *et al*., 2009).

Business valuation

Industrial firms with severe pollution problems often faced financial problems due to weak management. They were producing the wrong product mix with inefficient machinery (Gallup & Marcotte, 2004). EMS adopters are more likely to rely on their complementary knowledge-based capabilities towards working with their network of suppliers to minimise system-wide environmental impacts (Darnall et.al, 2008 as cited by Shi *et.al* 2012). Companies that have a weak awareness in environmental issues tend to have higher energy usage and higher operational costs (Shi *et.al*, 2012).

Valuation is carried out for company's balance sheet and to be incorporated in a prospectus when the company is going public; or when it is the subject of a takeover or merger bid. Valuation therefore has a crucial role to play in the overall workings of the property market and by extension the overall financial system of most economies (Babawale *et.al*, 2011). To perform this function creditably, valuations must provide good proxy for transaction prices. Regrettably, there exist persuasive grounds, both conceptual and empirical, to suggest that inaccuracy in valuation is inevitable, such that valuations may not be able to fulfill the intended role (Harvard, 1995; Babawale *et.al*, 2011). By definition, cleaner production creates value for a company by reducing its operational costs through the elimination of inefficiencies in the use of materials and energy, which in turn happens to have environmental benefits (UNIDO, 2010).

Companies were able to gain a competitive advantage and value of the business via combination of benefits. Further, owing to their small size, SMEs may be flexible enough to move quickly to offer "greener" products in order to appeal to consumers who are increasingly concerned with environmental or social issues as cited by Loucks *et.al*, (2010). Companies with a high carbon footprint face a competitive disadvantage that is likely to grow in the coming years'' (Harvard Business Green, 2008, pp. 42 cited by Menzel *et.al*, 2010). Recent studies indicate other benefits for green buildings; higher rental and building value, and savings in operational costs (McGraw Hill Construction, 2010; Milleret.al, 2008). Recent research shows that investors can benefit from green certificates by higher occupancy rates and rents (Miller *et.al*, 2009).

The line of industry of a company affects the willingness to rent green. Industries which can be categorized environmentally-sensitive are more likely to rent green. Firms in the legal and financial services and mining and manufacturing industries are more likely to rent green space (Eichholtz *et.al*, 2009 cited by Karhu *et.al*, 2012). The optimal solution is based on the illustration of best cost-benefit scenarios. Results of this study suggest that location in its environmental sense may be a relevant factor as well (Karhu *et.al*, 2012).

There is substantial potential for environmental initiatives to flow seamlessly throughout a firm's marketing as well as a holistic marketing within the firm and supply chain (Kirchoff *et.al*, 2011) advertising and packaging (Esper *et.al*, 2009) departments in ways that can help improve financial performance, reduce the environmental impact of products and services including manufacturing process (Kirchoff *et.al*, 2011) in a way its profitable (Isaak, 2002; Peattie, 1995).

Companies which operate in environmentally sensitive sectors, like in construction, industrial and energy sectors placed environmental attributes higher than other sectors. The optimal solution is then determined, based on the illustration of best cost-benefit scenarios which increase the profits. Results of this study suggest that location in its environmental sense may be a relevant factor (Eichholtz *et.al*, 2009 cited by Karhu *et.al*, 2012).

Analysis and Discussion

Table 1 - Global warming potential

Substance	Global Warming Potential GWPi (GWPi in kg CO_2-equivalant/kg)
CO_2	1
CH_4	23
N_2O	296

Source: Calculation Details of GWP for the 2006 & 2015 Targets: A Study to Examine the Costs and Benefits of the ELV Directive – Final Report

Usage (kWh) × CO_2 emission factor (kgs CO_2/kWh) × 1 GWP ---------- (i)

+

Usage (kWh) × CH_4 emission factor (kgs CH_4/kWh) × 23 GWP --------- (ii)

+

Usage (kWh) × N_2O emission factor (kgs CO_2/kWh) × 296 GWP -------- (iii)

=

CO_2 emissions (tons)

Based on the above summation of equation (i), (ii) and (iii) it indicates the total CO_2 emission level.

Table 2 - Energy usage level

Machine information		Factory XYZ			
		October 2014 7.00 am - 6.00 pm shift			
No	Machine	kW	Hrs/day	kWh/Day	Effective Load
1	Bale cutter	1.50	2.00	3.00	1.29
2	Two roll mill 1	55.95	8.00	447.60	192.47
4	Boiler burner	7.50	7.00	52.50	22.58
5	Pre-heating mill	44.76	8.00	358.08	153.97
6	Strainer 1	22.38	8.00	179.04	76.99
7	Strainer 2	22.38	8.00	179.04	76.99
8	Sulphur mill	44.76	9.00	402.84	173.22
9	Feeding mill	18.50	11.00	203.50	87.51
10	Extruder	37.00	11.00	407.00	175.01
11	Conveyor 1	0.37	11.00	4.07	1.75
12	Conveyor 2	2.00	11.00	22.00	9.46
13	R/Band cutter 1	2.00	11.00	22.00	9.46
16	R/Band Strainer 1	0.75	11.00	8.21	3.53
17	R/Band Strainer 2	0.75	11.00	8.21	3.53
19	Siliconning Machine	0.75	10.00	7.46	3.21
20	Bulbs	10.00	11.00	110.00	47.30
Extruded				2,414.54	1,038.25
20	14 press	11.19	11.00	123.09	52.93
21	13 press	11.19	11.00	123.09	52.93
22	7-12 press	11.19	11.50	128.69	55.33
23	1-6 press	11.19	21.00	234.99	101.05
24	Two roll mill 2	55.95	8.00	447.60	192.47
25	Bulbs	10.00	-	-	-

Molded				1,057.46	454.71
Total kWh		1,492.96			

Source: Compiled by Author

Table 1 shows detailed data were collected during the production process. Initially, detailed discussions were conducted with factory owner and the technician. Both the Ceylon Electricity Board (CEB) and furnace oil have used to generate the energy need. The analysis was starting from raw rubber or master batches to dispatching (gate to gate) during the research.

Table 2 - Carbon dioxide emission level – Factory XYZ

Contaminant	Factory XYZ
Electricity	
Total kWh consumption at factory, per month (kWh)	31,147.59
CO_2 emission rate kg/1 kWh, per month (kg)	0.400
CH_4	0.080
N_2O	0.030
Total CO_2 emission rate	12.459
Total CH_4 emission rate	2.492
Total N_2O emission rate	0.934
Total CO_2 emission kg/kWh, per month	15.89
Furnace oil	
Furnas oil for Rubber band lines (Ltrs) per month	10,500.00
CO_2 emission rate kg/1 liter of furnace oil, per month	2.900
CH_4 Factor	0.022
N_2O Factor	0.016
Total CO_2 emission rate	30,450
Total CH_4 emission rate	0.209
Total N_2O emission rate	0.152

Total CO_2 emission kg/kWh, per month	30.85
Monthly rubber band production (ton)	28.00
Emitted total CO_2 QTY(Tons) per rubber band 1 ton	1.67

Source: Compiled by Author

Table 2 shows the total electricity consumption per month and the emission level of data gathered from Factory XYZ, whereby arriving at total CO_2 emission level, CH_4 emission level and N_2O emission level, multiplying the usage of electricity and furnace oil. By adding CO_2, CH_4 and N_2O levels, total CO_2 emission level has been derived.

Derivation of business valuation

Table 3 - Net asset value basis – Factory XYZ

Particulars	Type	Value
Fixed Assets	Land and Building	168,000,000.00
	Furniture / Equipment Tools	25,441,647.31
	Vehicles	53,550,000.00
	Sub –Total	246,991,647.31
ADD: Current Assets	Bank Balances - S/A, C/A, FRC A/C	61,232,414.88
	Short Term Fixed Deposits	93,000,000.00
	Sub –Total	154,232,414.88
LESS: Current Liabilities	Payment due to Chairman	16,168,602.07
	Creditors - Loan	7,000,000.00
	Tax Liabilities	38,697,742.00
	Bank Overdraft	1,712,023.76
	Trade and Other Payable	2,804,000.00
	Sub –Total	66,382,367.83
ADD: Long Term Investments	Shares in Other Companies	489,996.57
	Fixed Deposits	10,000,000.00
	Sub –Total	10,489,996.57
LESS: Long Term Liabilities	Provision for Gratuities	48,687,500.00

	Sub –Total	48,687,500.00
Net Asset Value		296,644,190.93

Source: Compiled by Author

The Table 3 reveals that the total asset value of the business is Two Hundred and Ninety Six Million Six Hundred and Forty Four Thousand One Hundred and Ninety Cents Ninety Three.

Table 4 - Goodwill valuation – Factory XYZ

Particulars	Value (Rs)
Average Profit/Loss from 2007 to 2012	22,884,500.37
Less: Adjusted full rental Value	12,000,000.00
Net Average Profit	10,884,500.37
Years Purchase	3
Value of Goodwill	32,653,501.10

Source: Compiled by Author

The Table 4 reveals that the total goodwill valuation is Thirty Two Million Six Hundred and Fifty Three Thousand Five Hundred and One Cents Ten.

Table 5 - Businesses valuation – Factory XYZ

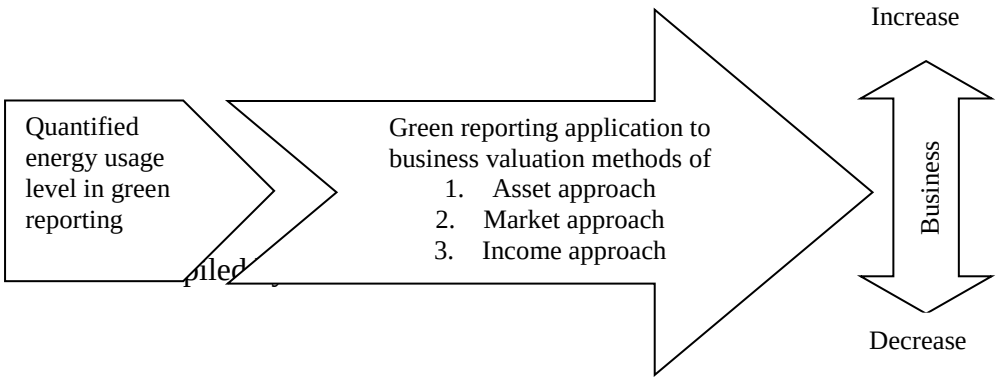
Net Asset Value	296,644,190.93
Goodwill Value	32,653,501.10
Total Business Value	329,297,692.03
Say	329,000,000.00

Source: Compiled by Author

In Table 5 it reveals the total business valuation under the fixed asset method including both the assets and goodwill as Sri Lankan Rupees Three Hundred and Twenty Nine Million.

Conclusion and Recommendation

Diagram 1- Development of the model leading to change the business valuation



The Diagram 1 shows requirement of business valuation adjustments depending on the energy usage of the Factory as a resource efficiency which will result to increase/decrease of business valuation. Therefore, it is recommended to include the environmental impact due to the emission level of carbon dioxide level at the time of deriving business valuation. Accordingly, it provides fair valuation to the ethical business practices in both the business valuation process and the transparency of the environmental impact. This can be applied to any industry in the world not particularly to rubber manufacturing sector.

In the business valuation, no consideration has been made to carry out any adjustments for the environmental impact due to emission level of carbon dioxide. Special emphasis should be on the businesses where there is no green reporting component in their reporting. Accordingly, all the stakeholders are required to consider green reporting at the time of deriving business valuation. As a result, the value of the business has to be changed based on the level of carbon dioxide emission to the environment. This leads to provision of economic performance indicators for the present and the future economic performances and environmental performance indicators are used to measure resource efficiency and social performance indicators address the effectiveness of policy.

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Abbreviation

CE	Clean Energy
CEB	Ceylon Electricity Board
CERES	Coalition for Environmentally Responsible Economies
CH_4	Methane
CO_2	Carbon Dioxide
E^3ST	Energy-efficient environmentally sound technologies
EC	European Commission
EMS	Environmental Management System
EP^3	Environmental Pollution Prevention Project
GHG	Greenhouse gas
GRI	Green Reporting Initiative

HFCs	Hydro Flouro Carbon
ISO	International Standards Organization
LCA	Life Cycle Analysis
N_2O	Nitrous Oxide
NAV	Net asset value
NGRS	National green reporting system
NPV	Net present value
OECD	organization for Economic Development and Corporation
PFCs	per Fluorocarbons
R&D	Research and Development
SF_6	Sulphur Hexafluoride
SME	Small and Medium Scale Enterprises
UK	United Kingdom
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization

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