6 Detailed analysis of the current plastic VCB value chain

6.1 Polymer production

6.1.1 Monomers

The ethylene monomer is produced by Sasol Polymers based on a by-product stream that is produced by the synthetic fuel process at Sasol. Sasol Polymers then splits the ethane from the ethylene and then cracks the ethane to produce further ethylene. The total current ethylene produced is approximately 450,000 tons per annum that is then used downstream for polymer manufacture. Sasol allocates a portion of the ethylene production to DOW Polymers for the production of HDPE and then utilises the remainder in Sasol Polymers for the production of LDPE and LLDPE.

In the past not all the ethylene was available to the downstream petro-chemical sector. This is no longer the case and the total available capacity is currently being used for polymer manufacture. While the limits on ethylene capacity is not the only factor constraining downstream polymer manufacture it is one of the major impacting factors

Whether or not the proposed legislation increases demand for polymers, there is insufficient ethylene capacity to meet such demand and any additional polymer required will have to be imported, at least in the short term. Downstream capacity expansions (of polymer capacity) either at Sasol Polymers or DOW Plastics will require an increase in ethylene capacity as well as further investment in downstream plant. Sasol is currently considering such an expansion.

The question needs to be raised about this possibility of increasing ethylene capacity. We understand that Sasol is continually reviewing its position.

There is no doubt that any increase in monomer capacity will not be driven solely by any proposed legislation but rather by indications that domestic market demand has increased in a sustainable fashion by at least 100,000 tons per annum. In fact, indications are that the proposed legislation could create significant uncertainty among investors and in fact cause Sasol to delay or abandon any further investment plans in this sector.

If Sasol were to increase ethylene capacity, this would most likely be greater than 200,000 tons per annum in order to ensure economies of scale at both monomer and polymer level. Any increase in ethylene capacity would have to be accompanied by a simultaneous expansion of polymer capacity. Judging by the current South African supply/ demand balances this would most likely be in the area of LDPE and LLDPE. Some ethylene would probably also be made available to DOW Plastics to increase HDPE capacity if required.

Note: The above volume estimates do not come from Sasol Polymers or DOW Plastics but are based on consultant estimates of requirements in an industry of this nature.

6.1.2 Polymers

There are only two manufacturers of polymer in South Africa. In the case of ethylene based polymers there is only a single manufacturer of each product and in the case on polypropylene, both parties are involved in its manufacture. Only the polyethylene's are of interest in this assessment.

The table below depicts the current supply and demand balances for ethylene based polymers.

Polymer	Domestic Capacity/ tpa	Domestic Demand	Imports	Exports	Surplus/ (Shortage)
HDPE	165,000	155,000	-	10,000	+10,000
LDPE	95,000	115,000	20,000	-	-20,000
LLDPE	90,000	110,000	20,000	-	-20,000

Notes:

HDPE – The plant is current running at 165,000 tons per annum. This is due to the ethylene shortage. If more ethylene was available then the plant could be debottlenecked to produce up to 220,000 tons per annum.

LDPE – The plant is running at maximum capacity. Market demand is higher than available capacity and Sasol Polymers is unable to meet domestic market demand from local production. The balance is imported by a number of parties.

LLDPE – The plant is running at 90,000 tons per annum although it has the potential to produce 110,000 tons per annum. The ethylene shortage drives the amount of capacity than can be utilised. Market demand is greater than domestic ability to supply and 20,000 tons per annum is imported. Approximately 50% of these imports are metallocenes which are not produced locally.

In summary:

- Due to the ethylene shortage there is no ability for South Africa to provide more domestically produced polymer into the local market – at least in the short tem. Any additional demand for polymer will have to be met through imports
- Any expansion will initially have to address the ethylene shortage
- Further capital investment is likely to take the form of expanding capacity of all ethylene based polymers i.e. HDPE, LDPE and LLDPE (some expansions will be debottlenecking of existing plant and other expansions may be new plant)

6.2 The VCB manufacturing (conversion) industry

It has been estimated elsewhere in the report that the current VCB manufacturing industry in South Africa converts 44 000 tonnes of polyethylene per annum into VCB's of different dimensions and with different properties, for different applications.

The total value (revenue) of the industry was calculated as part of this research to be in the region of R 550 million per annum.

The research identified 42 companies that produce VCB's, ranging from very small operations with turnovers of less than R 5 million per annum, and employing less than 15 people, to large companies with annual turnovers in excess of R 200 million, and employing up to 500 people.

Although the data collected was representative in terms of tonnages (75% of total production) produced, it was not representative in terms of the number of companies (26%) from whom data was collected.

Based on the data collected as part of this study, as well as supplementary information sourced from industry, it became quite clear that the VCB manufacturing industry displays the typical characteristics of a mature commodity industry, operating primarily in a limited domestic market, as follows:

- There are a small number of large companies that have significant (70 - 75%) market share. Being in a commodity market these companies cannot compete with each other on a product differentiation basis, and have to compete on efficiencies (optimisation of the cost and volume equation). Quality, which in this case means a printed bag that meets certain minimum specifications in terms of strength, dimensions etc., is a pre-requisite rather than a differentiator.
- There are a large number of small companies that seek out the niches in the market that is not served by the large manufacturers. The niche markets are created by two factors:
    - The "minimum run" factor: As part of the optimisation of the cost/volume curve by large manufacturers, there are certain minimum volumes of one type of bag that must be manufactured for the process to be economically viable. Such "minimum runs" could be as high as 300 000 for a printed bag. This obviously creates opportunities in the market for smaller players, with less sophisticated and lower volume machinery, to manufacture smaller orders of printed bags.
    - The demand for "plain carrier bag" that is primarily used by smaller retailers. These bags, which are unprinted, and normally "plain" grey or brownish in colour, are manufactured primarily from first generation reprocessed material. The demand for "plain carrier bags is driven by retailers who have no need for printed bags, wants to spend the absolute minimum on bags, and are not as quality conscious as the large retailers. The price difference between "plain" bags and "quality printed bags" is approximately 50%, for example printed Midi type bags are sold at between R 80 and 90 per 1000 bags, whereas the plain equivalent will sell for as low as R 35-40 per 1000 bags.

Although large manufacturers do produce “plain” bags, the volume is usually restricted to the equivalent of in-house waste material generated, typically 10% of total production. The outstanding demand is catered for by small manufacturers, who buy first generation or “clean” post consumer waste from recyclers.

It is therefore concluded that the VCB manufacturing industry can be segmented into two categories, as follows:

Segment	Markets and products	Technology	Labour intensity
Large manufacturers pursuing efficiency	Large retail industry High quality printed products Three or four products	State of the art or first generation Low flexibility Large production runs	Low Bags per person ration above 40 000 :1
Small and medium size manufacturers pursuing niche markets	Small and medium retail industry High quality printed and lower quality unprinted bags Large variety	Third generation or older technology High flexibility Short production runs	High Bags per person ratio 20 000 : 1 and lower

6.2.1 Production, capacity and technology

The following provides a summary data collected from the survey on total plastic production, VCB production and VCB capacity.

Segment	Total plastic production (t)	Total plastic capacity (t)	Total VCB production (t)	Total VCB capacity (t)
Large manufacturers pursuing efficiency	29 610	30 766	28 780	29 766
Small and medium size manufacturers pursuing niche markets	9 786	12 955	5958	7418
Total	39 396	43721	34 738	37 184

A first observation is that the VCB industry can be considered to be a specialised industry in that company’s that manufacture VCB’s do not typically produce large volumes of other products as well. 88% of total production is for VCB’s only, and further analysis of the data reveals that the other 12% is plastic film. No products other than VCB’s or plastic film is being produced by any of the manufacturing plants surveyed.

There is currently excess VCB manufacture capacity of approximately 2 500 t. Of this 1300 tonnes (approximately 52%) is due to demand not meeting current supply capacity, and 48% is due most small companies electing not to manufacture over the weekend. It was established that on average,

small and medium sized companies do not produce for 36 hours out of the maximum of 168 hours per week. This translates to 1200 tonnes, which cannot automatically be considered to be immediately available excess capacity. Many factors, such as cost of overtime, existing worker agreements, technological flexibility and availability of management, play a role when small and medium sized companies determine manufacturing.

6.2.2 Capital investment

Due to the lack of complete data provided by the VCB manufacturers it is impossible to determine exact figures of the current value of investment in the VCB industry, either from a book value or replacement value perspective. Nor is it possible to report on the historical investment in the industry over the last ten years. Based on the available data and information gathered from interviews with VCB manufacturers, the following can be concluded:

- 5 manufacturers, representing no more than 60% of the industry output provided data on current book value of equipment. The total book value of the equipment of these manufacturers equalled approximately R 50 million. The total current book value of equipment is unknown, but it can be concluded that it is in excess of R 50 million.
- The same 5 manufacturers indicated that they invested R 120 million over the last 10 years into VCB manufacturing equipment. The total historical investment in the VCB industry is also unknown, and it is concluded that it is in excess of R 120 million
- Equipment is generally depreciated over 5 years (straight line).
- Equipment life is in excess of 20 years. It was found that even the oldest technology in use has a remaining life in excess of 20 years.
- The capital investment profile is driven by four variables, namely:
    - The volumes produced. The relationship between volume and capital is not continuous, but step changes take place.
    - Print or non-print. Since there are markets for both printed and unprinted bags, the converter has the choice of investing in printing equipment or not.
    - The age of equipment, which is also indicative of the state of technological advancement.
    - The equipment supplier. There is a significant difference between the cost (and quality) of European equipment and those manufactured in Asia.
- The requirement for capital can not be seen to be a barrier to entry for SME's, neither are skill requirements.

The following diagram illustrates how a small company can enter the VCB market successfully with a relative low capital outlay of less than R 500 000

Range of activities:	Extrusion and bag making
Volumes:	Extrusion: 12 t/month
	Bag making: 1-1.5 million per month
Equipment:	Either second hand European and can be 15 years and older
	Technology is then third generation or older
	Or can be newer Eastern equipment, which is newer technology but have a short lifespan
Capital requirement	Less than R 500 000

6.2.3 Cost and value add analysis

VCB converters were reluctant to provide accurate costing information, especially information on profit margins. The manufacturing costs of converters ranged according to a number of factors such as print or unprinted, amount of reprocessed used, labour intensity, etc. It was interesting to note that even information provided by some manufacturers that are comparable in terms of product offering and size, reported quite different cost structures. For example one producer reported an average production cost of well over R 15 000 per ton, whereas a comparable counterpart reported it to be R 12 000 per ton.

There was general agreement that manufacturing cost within the VCB manufacturing industry, being a commodity industry, is driven by raw material cost, which constitutes approximately 60% of the total product cost, Labour costs add another 20% and the remaining 20% is made up of various items such as consumables, rent, energy, etc.

It is interesting to note that the above 60:20:20 equation is very similar for both the larger companies whom are less labour intensive and achieve high efficiencies, and for the small companies whom are more labour intensive and less efficient. This is primarily due to the fact that high efficiencies gained through modern equipment by large manufacturers (throughput gains as well as being less labour intensive), are offset by increased labour costs (higher relative wage rates) as well as higher relative overheads.

It was also noted that the reported prices paid by large retailers, which one would expect to be fairly similar, was not similar in all cases. One large retail group, for example reported an average cost of R10 500 per tonne, whereas the other retailers reported higher costs, up to R14000 per tonne. An average cost of R13 581 per tonne is a calculated weighted average cost across large retailers.

In view of the lack of accurate and detailed information provided by converters, the cost analysis is done from data collected from retailers on the actual price paid. This was then compared with the data provided by VCB manufacturers as a reality check. The following summarises the costs used as baseline product costs for purposes of the research.

It must be noted that these are average costs. Current prices asked for VCB's range widely, depending on the type, the thickness, the quality, whether printed or not, and the quantities supplied.

For example: A good quality Handy type bag of 14ì and printed will be priced at approximately R65 per 1000, whereas a lower quality “plain” Handy of 10ì will be available at R 40 per 1000 bags.

Retail category and products	Consumption (billions)	Cost per 1000 bags	Cost per ton
Large retailers, printed bags	2.552	R 79.28	R 13 581
Smaller retailers, printed bags	2.314	R 78.26	R 13 332
Smaller retailers, unprinted bags	3.158	R 59.66	R 13 714
Weighted average		R 71.56	R 13 581

It is concluded that the total value of the VCB industry is R 571 million per annum, with the value add component thereof representing 40%.

For purposes of this study the average costs are used as follows:

	Percentage	Cost/ton
Raw material cost	60%	7 334
Labour	20%	2 445
Other	20%	2 445
Total manufacturing cost	100%	12 223
Margin	10%	1 358
Sales price		13 581

Note that although the total average selling price per ton (R 13 581) is an accurate industry average, there are significant variations in the margins, labour cost and raw material cost between manufacturers. These variations however even out due to differences in efficiencies, as earlier explained.

The value of the VCB industry, as determined, includes the value added by secondary industries, of which the most significant are as follows:

- Transport: The larger manufacturers have generally outsourced their transport, whereas the smaller manufacturers use a combination of own transport and contracted transport. The cost of transport was found to be approximately 7% of total manufacturing cost.
- Ink suppliers: The cost of ink is relevant to companies that print bags.
- Engineering companies: The manufacturing of spares, etc.

6.2.4 Labour analysis

This section uses information collected by the research team to estimate the number of people employed within the VCB industry, the nature of employment, working conditions, remuneration, dependants, and prospects for re-employment. A final section summarises the views of worker representatives on the proposed regulations.

Two sources of data were used to establish employment and employment conditions in the VCB industry.

First, an extensive set of questions was included in the questionnaire sent out to VCB manufacturers. The overall response rate to this questionnaire of 28 percent was further decreased with regards to this section of the report as many companies were either unable or unwilling to complete the labour sections of the questionnaire as requested.

Second, a number of in-depth interviews were conducted with worker representatives. Where access to shop stewards was granted by companies this was generally of a good quality A total of 21 individuals were interviewed, of these 16 were considered to be *bona fide* shop stewards whose information was considered reliable by the interviewers.

Shop Steward	Segment of industry	Company or Site	Union	Gender	Years employed in company	Years in the union
1	High Productivity	A	Ceppwawu	Male	6	5
2	High Productivity	A	Ceppwawu	Male	5	5
3	High Productivity	A	Ceppwawu	Male	13	13
4	High Productivity	A	Ceppwawu	Male	7	7
5	High Productivity	B	Ceppwawu	Male	5	2
6	High Productivity	C	Ceppwawu	Male	2	0.5
7	High Productivity	D	Ceppwawu	Male	5	4
8	High Productivity	E	Ceppwawu	Male	4	3.5
9	High Productivity	E	Ceppwawu	Male	9	7
10	Low Productivity	F	Ceppwawu	Male	3	3
11	Low Productivity	F	Ceppwawu	Male	3	3
12	Low Productivity	G	Ceppwawu	Male	3	5
13	Low Productivity	G	Ceppwawu	Male	11	10
14	Low Productivity	G	Ceppwawu	Male	2	2
15	Low Productivity	H	Numsa	Male	11	7
16	Low Productivity	H	Numsa	Male	11	7

Quality of Interview Data

With the exception of five interviewees the evidence provided is believed to be relevant and reliable. Evidence from these five interviews was not used in the statistical analysis.

Three of these interviews were conducted with union members who were not shop stewards. The data provided by these individuals is believed to be reliable, the reason for not including them is that their job positions (HR manager, supervisor, and a fitter and turner) are not representative of the majority of workers in the industry. Use of this data would have biased the data as presented.

One interview was restricted due to a combination of language difficulties and limited privacy (from management) during the interview. In the case of this one interview the independence of the shop steward from management was doubted. This belief is based on the recent introduction of the union into the company (within three weeks of the interview) and the perception that the interviewee may have been selected by management. This, combined with a number of discrepancies in the evidence provided led to the rejection of this data as unreliable.

Despite the limited response from the questionnaire, the information provided, supplemented by the shop steward interviews, allows an understanding of employment and employment conditions to be developed.

Analytical Framework

As outlined elsewhere in this report the VCB manufacturing industry can be divided into two segments:

- A 'High Productivity Segment' pursuing efficiency, consisting of three companies (five sites) that produces an estimated 31,780 tonnes[16] of the industry total of 44,000 tonnes of VCBs.
- A 'Low Productivity Segment' pursuing niche markets, with an estimated 39 companies. In this segment production data was collected on ten companies with a total production of 5,958 tonnes.

Features of the Two Industry Segments

Productivity, measured as VCB output (tonnes) per employee, correlates well with different labour conditions in the two segments. This is more fully reported in the following sections.

The following table summarises the data on productivity, minimum wage levels, and the average size of sites in the two segments.

[16] This estimate consists of the 28,780 tonnes recorded from two companies with four sites and an estimate of 3,000 tonnes of production for the remaining company in this segment for which detailed labour but not production data was obtained.

Variable	High Productivity Segment (5 sites)	Low Productivity Segment (10 sites)
Total VCB tonnage	31,780	5,958
VCB employment	766	469
Productivity (tonnes per employee)	41.5	12.7
Average number of VCB related employees per site	153	47
Average (un-weighted) minimum wage (Rands per hour)	10.1	4.8 (information from fives sites only)
Range of minimum wage (Rands per hour)	9.01 – 11.82	2.65 – 7.73

Number of Employees in the VCB Industry

The number of employees in the VCB Industry is calculated on the following basis.

Number of High Productivity Segment jobs recorded

+ Number of Low Productivity Segment jobs recorded in ten sites

+ Extrapolation of unrecorded employment based on unrecorded VCB polymer tonnage (6,262 tonnes) and estimated productivity for this segment.

It is assumed that unrecorded employment is located in the Low Productivity Segment since it is highly unlikely that the research process did not locate all plants in the High Productivity Segment of the industry. It is further assumed that the productivity of unrecorded employees will be at or below the average productivity for the Low Productivity Segment. A credible range of employment is therefore provided by calculating the extrapolated employment at the average productivity for the Low Productivity Segment (12.7 tonnes per employee) and the lowest level of productivity recorded (9.2 tonnes per employee).

VCB Industry Segment	Minimum estimate of employees. (Unrecorded employees estimated at a productivity of 12.7 tonnes per employee)	Maximum estimate of employees. (Unrecorded employees estimated at a productivity of 9.2 tonnes per employee)
Recorded High Productivity Segment	766 (including overall estimate of outsourced functions)	766 (including overall estimate of outsourced functions)
Recorded Low Productivity Segment	469	469
Estimate of remaining companies converting 6,262 tonnes	493	681
Total	**1728**	**1916**

While extrapolations produce apparently precise estimates of the employment range this accuracy is likely to be 'spurious'. Thus, it is estimated that employment in the VCB industry lies somewhere between 1,700 and 2,000 employees.

Employment Trends in the VCB Industry

Employment trends in the industry are complex. In the High Productivity Segment of the industry, processes of capital concentration and production rationalisation have resulted in a trend towards decreased employment. In the Low Productivity Segment there are more mixed employment trends. The dominant influence here would appear to be market conditions. Given the small size of many of these companies these conditions may well be local in nature.

Some data was provided by the companies in response to the questionnaire, in a small number of cases this was provided for since 1992. In other cases information on employment was obtained during interviews with worker representatives. In this situation changes in employment over the last five years were asked for in the interests of reliability given that the information was dependent on individuals' recall.

Employment Trends in the High Productivity Segment of the Industry

In the High Productivity Segment of the industry changes in employment are dominated by a focus on increased capital intensity and accompanying rationalisation of production locations.

The largest company in this segment has as a result of extensive rationalisation of production reduced its directly employed VCB related workers by 35% (269 employees) between 1992 and 2001. However, if the effects of introducing subcontracting are taken into account this is reduced to approximately 29% (223 jobs).

If a shorter time period is taken into account the loss of jobs is more dramatic as employment in this company expanded between 1992 and 1995. If this latter date is used as the base line, rationalisation of production has resulted in a reduction of its workforce by 47% (436 employees), reduced to approximately 40% (376 jobs) if subcontracting is taken into account.

The second largest company (established in 1996) carried out the retrenchment of 10% (12 employees) of its workers in 1999 as a result of the purchase of new machines. However, half of the retrenched workers were subsequently re-employed as it was found that the cuts were not sustainable.

The other smaller and newer companies in this segment appear to have held employment constant over the last five years (the period in which worker representative were asked for information on

retrenchments), presumably reflecting a newer capital base (1999 in one case) and/or increased production.

Employment Trends in the Low Productivity Segment of the Industry

At the Low Productivity Segment of the industry employment trends are more mixed. Where changes have occurred they appear to have been driven by market conditions rather than capitalisation processes. A union official responsible for the plastics industry indicated that a number of companies in the Low Productivity Segment of the industry in the Free State faced increasingly difficult market conditions. This was explained as the result of retrenchments in the mining industry as there had been a decrease in demand for low quality plastic bags from shops serving the mine workforces. This would indicate that the market conditions faced by small companies may often be local in nature.

Data on employment trends was obtained from four companies in this segment of the industry.

One company had steadily increased its workforce by 44% between 1993 and 2001 (to 26 employees).

One company had maintained employment levels (at 40 employees) over the past five years.

The other two companies had carried out retrenchments within the last five years.

One of these had retrenched 19% of its workforce (24 employees) due to market conditions (within the last five years, date not known) but had subsequently re-employed half of these. The other company retrenched 14% of its workforce (33 employees) in 2000 and since this date has operated a recruitment freeze resulting in a net reduction of a further four jobs.

Nature of Employment in the Industry

Occupational Profile

Film Blowing, Printing, Bag Making and Packing

The major employment categories in the manufacture of plastic bags are:

- Film blowing operators and (limited number of) assistants
- Printing operators and (limited number of) assistants
- Bag making machine operators and packers (approximately equal numbers)

These positions are generally semi-skilled (operators) and low-skilled (assistants and packers).

Employment in film blowing, printing, bag making and packing in the VCB Industry

Segment of the Industry	**Film blowing**	**Printing**	**Bag making and packing**	**Total film blowing, printing, and bag making**
High Productivity Segment (n = 5, with 766 employees)	12% (92)	9% (67)	42% (322)	63% (481)
Low Productivity Segment (n = 4, with 317 employees)	20% (62)	11% (35)	40% (126)	70% (223)
Total: (High Productivity Segment and four Low Productivity Segment Companies, n = 9, with 1083 employees)	14% (154)	9% (102)	41% (448)	65% (704)

Note: totals do not add due to rounding.

In the High Productivity Segment of the industry these three occupational categories employ 63% of the VCB labour force (481 employees). Reliable data from four companies in the Low Productivity Segment of the industry puts these employment categories at 70% of the VCB labour force (223 employees).

This difference in the percentage of labour absorbed by these key production functions between the High and Low Productivity Segments of the industry is increased if the different shift systems operating are taken into account. High Productivity Segment companies operate three or four shift systems (with one exception that uses a two shifts plus voluntary overtime and casuals at weekend), while Low Productivity Segment companies operate two or three shift systems.

This difference reflects the different capital intensities, focused on the main production processes, between the two industry segments. However, it should be noticed that increased capital intensity has a relatively greater employment impact on film blowing and printing operations. The ratio of these three categories of employment in the two industry segments are:

Segment of industry	Employment ratio film blowing	Employment ratio printing	Employment ratio bag making and packing
High Productivity Segment	1	0.9	2.9
Low Productivity Segment	1	1	1.9

Other Occupations in the VCB industry

Occupation	Percentage of workforce in High Productivity Segment (n = 5)	Percentage of workforce in Low Productivity Segment (n = 4)
In-company recycling	2.2%	4.4%
Mixing	1.6%	2.1%
Distribution and Transport	9.5% (includes estimates of outsourced services)	5.9%
Artisans and assistants	4%	0
Supervisors	1.6%	3.3%
Administration	2.9%	3.0% (n = 3)
Management	4.2% (n = 4)	8.3% (n = 3)
Other occupations and unaccounted	11%	1%

- *In-company recycling*

This is a small operation involving low or semi-skilled workers.

- *Mixing*

This function is often carried out by supervisors. Dedicated mixers represent a small percentage of the total workforce.

- *Distribution and Transport*

Employment in this section is uneven; most companies operate their own delivery systems while some expect customers to pick up their products. Additionally, these functions have been outsourced by the largest company in the segment (see section on outsourcing).

- *Artisans and assistants*

This employment category only exists in the High Productivity Segment of the industry. Maintenance and repairs in the Low Productivity Segment of the industry appear to be carried out either by management members or by outside contractors on a 'as needed' basis.

- *Supervisors*

This function is more important in the Low Productivity Segment of the industry. In the High Productivity Segment of the industry supervisory functions are often blended with operational duties.

- *Administration and Management*

Data on these occupations collected from interviews with worker representatives were less reliable than information collected on the workforce. This stemmed from the difficulty shop stewards had in differentiating administrative and management positions. Accuracy also appeared to decrease with large sites where shop stewards had less detailed knowledge of 'the office staff'. To the extent that the higher percentage of management in the Low Productivity Segment is reliable this could be accounted for by lack of management economies of scale in smaller companies and the fact that management in smaller companies tended to carry out functions of other occupations in the High Productivity Segment, for example the artisan function of machine maintenance and repair.

- *Other Occupations*

Cleaning is a minor employment category that a number of companies have outsourced. In the High Productivity Segment of the industry security is also outsourced. In the Low Productivity Segment of the industry a number of companies employ security directly.

A number of other positions that are not regularly represented across companies include:

- Canteen
- Stores (internal warehouse)
- Taxi drivers (for transporting workers)
- Doctor (part time)
- Sisters (part time)
- Social workers (part time)

These occupations are associated with the High Productivity Segment of the industry.

These other occupations (along with any error in estimations made by shop stewards) account for the unrecorded percentages of occupations of 11 % for the High Productivity Segment and 1% for the Low Productivity Segment.

Other factors that contribute to this 'dark figure' of 11% of occupational categories in the High Productivity Segment of the industry are the higher level of outsourcing for which detailed breakdown of occupation was not always possible, and the greater likely-hood of errors on the part of shop stewards in estimating the numbers of managers and administrators in larger operations.

Race, Gender, and Age of the Workforce

Gender

Eight companies (11 sites) provided an overall gender breakdown for the current period and this information was obtained from one further company by means of worker representative interviews, providing a total of 12 sites.

Industry Segment	Percentage male	Percentage female
High Productivity Segment (n = 5, with 748 employees, includes some non VCB, excludes outsourced workers)	70% (536)	30% (230)
Low Productivity Segment (n = 7, with 411 employees, includes some non VCB workers)	75% (309)	25% (102)
All (n = 11, with 1177 employees)	73% (845)	27% (332)

Relatively little data was collected on occupational categories by gender. However, site visits revealed a visible gender division of labour. In production, operators and their assistance in film blowing and printing were almost exclusively male. Bag machine operators and packers were predominately, though not exclusively, female. This observation, linked to the different capital-labour ratios in the High Productivity Segment of the industry would explain the higher percentage of women workers in this end of the industry.

This pattern also indicates that women in the VCB industry are generally in lower skilled (and therefore less well remunerated) jobs than men, though statistical evidence to demonstrate this was not provided by companies.

Race

Seven companies (11 sites) provided data on the race of all employees for 2001; this information was also obtained from one other company during interviews with worker representatives.

Industry Segment	African	White	Indian	Coloured
High Productivity Segment (n = 5, with 748 employees, includes some non-VCB, excludes outsourced workers)	57.1%	10.3%	1.2%	31.0%
Low Productivity Segment (n = 7, with 507 employees, includes some non-VCB employees)	74.6%	6.5%	10.7%	8.3%
All (n = 11, with 1255 employees)	64.1%	8.8%	5.0%	22.1%

Differences between the two segments are dominated largely by geographical location (e.g. plants in the Western Cape having a high percentage of coloured workers and plants in Kwa-Zulu Natal having a high percentage of Indian workers). The slightly higher percentage of whites working in the High Productivity Segment of the industry would be consistent with higher capital intensity requiring a higher skills profile, such as more artisans (who are often, though not always, white).

No statistical data was provided on occupational categories by race. Where this was collected during worker representative interviews and observations during site visits it indicates that Africans workers (or coloured in the Western Cape, Indian in Kwa-Zulu Natal) predominate in shop floor occupations such as film blowing, printing, and bag making. The only whites encountered in shop floor positions were artisans and supervisors.

In the High Productivity Segment of the industry there tended to also be African, Indian, and coloured employees in managerial positions. In the Low Productivity Segment the racial division between shop floor and management/admin was often complete. During one interview with worker representatives the interviewer sought clarity over whether the figure for the number of people working in the company calculated by the shop stewards included management. The response from the senior shop steward was ‘no’ because they didn’t realise we wanted to know about both ‘blacks and whites’ in the company.

Age

Information on age of all workers in 2001 was provided by five companies with eight sites. Four of these sites were in the High Productivity Segment of the industry and four sites in the Low Productivity Segment. The age distribution of workers is presented in the following table. Because companies only provided the age profile of their entire workforce it is not possible to provide more detailed breakdown based on age (e.g. occupations) nor link age to other demographic variable such as race and gender.

Age of employees	High Productivity Segment (four sites) n = 663	Low Productivity Segment (five sites) n = 384	Total (eight sites) n = 1047
<18	0	1.8%	0.7%
18 – 25	9.8%	14.1%	11.4%
26 – 35	44.9%	43.5%	44.4%
36 – 45	28.5%	23.4%	26.6%
46 – 60	16.0%	16.1%	16.0%
>60	0.8%	1.0%	0.9%

The majority of workers in VCB producing factories (71%) are between the ages of 26 and 45. The age profiles of the two industry segments are similar although the Low Productivity Segment has a wider variance, notably with employees younger than 26.

The Nature of Employment Contracts

The vast majority of employees in the 10 companies (13 sites) that provided data were on permanent full-time contracts, this was consistent with information provided in interviews with shop stewards.

These interviews indicated that the use of casuals and temporary workers was much less than had previously been the case, an observation that is likely to reflect changes in the law around casual and temporary workers. Casual and temporary employment often provided an employment route into the company for now permanent workers.

What casual and temporary employment exists is largely concentrated in a restricted number (two) companies in the Low Productivity Segment of the industry. There was also use of some casuals on a regular basis by one company in the High Productivity Segment of the industry to supplement a two-shift system so as to allow continuous operations over weekends.

Outsourcing

The data on outsourcing is particularly difficult as it involves other companies who were not interviewed. From the data that was collected it is clear that outsourcing is largely a phenomena of the High Productivity Segment of the Industry.

At the Low Productivity Segment of the industry outsourcing appears to be confined to security, cleaning, and maintenance, repair and other specialised functions. The first two of these categories were not always outsourced with a number of companies employing their own security and cleaning staff.

One company in the Low Productivity Segment of the industry claimed an outsourced Full Time Equivalent of 35 workers (with an estimated value of R 1,900,00), which would have represented 26% of the effective labour force (employed and outsourced services). However, this was not verified by interviews with shop stewards who could only list the company's armed response as outsourced. It was concluded that the company's evidence in this respect was unreliable.

This lack of outsourced activity in the Low Productivity Segment of the industry would be explained by the levels of remuneration in this segment That is, given the level of wages in this segment outsourcing would be unlikely to provide services at a lower cost.

In the High Productivity Segment of the industry outsourcing appears to be more common. While companies in this segment generally have better maintenance and repair capabilities in-house security and cleaning are more likely to be outsourced.

Additionally, one company had additionally outsourced canteen, distribution, and transport. At one site the dates given for this outsourcing by shop stewards were: canteen and security – longstanding outsourced services, transport – five years ago, cleaning – 3-4 years ago. This information was not collected from the companies other site. Subcontracting represented an estimated 10.7% of this company's total labour force.

Remuneration

Establishing remuneration of employees in the VCB industry is complex. The following factors effect the wages of employees.

- The employee's position and grade.
- The wage levels and other financial benefits operated by the company.
- The hours worked by the employee in a typical week.

The employee's position and grade

Since 1999 companies producing VCBs are covered by the Metal Industries Bargaining Council (MEIBC) Main Agreement.

As previously discussed, the majority of jobs in the production of VCBs are operators, operator assistants, and packers. All these categories of workers are classified within the lowest two grades of the 13-grade scale, G and H. The minimum wage level for these two grades was R10.95 and R10.30 per hour respectively at the time the research was carried out.

The Bargaining Council also sets the level of other benefits, such as shift allowances and sick pay.

The Actual wage levels and other financial benefits operated by the company

The situation in the VCB industry is more complex than that set out in the MEIBC's Main Agreement because on entry into the MEIBC a number of companies in the plastics industry negotiated exemptions on the minimum wage. This allowed for a three-year catch-up period to reach the then minimum wage level.

In addition to this transitional exemption, a number of companies have applied (and been granted) 'exemptions on the exemption', that is the originally negotiated increase designed to bring wages levels to an industry minimum is put aside. As a result, actual minimum wages, which set the floor for the wage range in each company, varies widely.

As previously indicated minimum wage levels differ between the High Productivity Segment and Low Productivity Segment of the industry. Some of this variation is indicated in the evidence presented below.

The hours worked by the employee in a typical week

This is primarily dependent on a) the number of hours per week that the company keeps machines running and b) the number of shifts employed by the company.

In the High Productivity Segment of the industry, machines are routinely kept running 24-hours a day, seven days a week, 11 months of the year. However, in terms of the number of hours worked by each employee this is often offset by a greater number of shifts (up to four) running the machines.

In the Low Productivity Segment of the industry companies employ a number of production strategies. While some attempt to keep machines running in a similar way to the High Productivity Segment of the industry, other close down their factories over the weekend. Companies in the Low Productivity Segment of the industry generally operate fewer shifts than the High Productivity Segment. This is possible through a combination of closing the factory over weekends, overtime, and the use of casuals.

As a result of these variables a wide range of overtime is possible. Companies reported a range in the average number of hours overtime for workers of between 2 and 22 hours per week.

Minimum Wage Levels

Combining data obtained from companies and from interviews with worker leaders data on the minimum wage for seven companies (11 sites) were obtained. This provides an important indicator the level of wages in the industry since most workers are at or close to this level.

In the High Productivity Segment of the industry minimum wages ranged between R9.01 and R11.82 per hour with an (un-weighted) average of R10.1 per hour.

In the Low Productivity Segment of the industry minimum wages ranged between R2.65 and R7.73 per hour with an (un-weighted) average of R4.8 per hour. Additionally, two companies in the Low Productivity Segment of the industry provided the *average* wage for low skilled workers. These were calculated at R5 and R5.40 per hour, consistent with the other data from this segment of the industry.

Take Home Pay

During interviews with worker representative questions were asked about wage levels. As previously outlined, 16 of the 21 interviews (nine in the High Productivity Segment and seven in the Low Productivity Segment) can be regarded as providing reliable information as to typical remuneration in this industry. Of the 16 interviewees, eight were bag machine operators, seven were extruder operators, and one was a quality controller.

Take home pay was calculated as the employers take home wages *plus* deductions taken for loan repayments. Deductions made from gross pay not included in this figure include tax, UIF, union stop orders, and pension or provident fund.

The following table gives details of worker representative's wages and benefits.

Industry Segment	Average take home pay per month	Range of take home pay	Tax paid?	Company contribution to medical aid scheme?	Company contribution to pension or provident fund?
High Productivity Segment (n = 9)	R2,552	R1,624 – R3,350	All	None	All
Low Productivity Segment (n = 7)	R1,454	R980 – R2,100	Two out of seven	None	Five out of seven
All (n = 16)	R2,072	R980 – R3,350	11 out of 16	None	14 out of 16

Differences between the two segments of the industry can be seen in the average take home pay. In addition, the division between the segments is manifested in whether employees pay taxes or not, since most worker representatives in the Low Productivity Segment of the industry earned wages below the tax threshold.

None of the companies contributed to medical aid cover and only two of the sixteen interviewees were members of a medical aid scheme.

By contrast, 14 out of 16 interviewees were members of a pension or provident fund that the employer contributed towards. The most common such fund were those organised by the Metal and Engineering Industries Bargaining Council, Ceppwawu (CINPF), and a company fund operated by one large firm in the High Productivity Segment of the industry.

In addition to pension/provident schemes workers in some companies in the High Productivity Segment of the industry had disability insurance schemes. Where this was the case the employer contributed towards the scheme.

Typically employers match contributions from workers. These are around 6% of gross wage for pension or provident funds and between 2.5 and 4.5% of gross wages for disability insurance.

Travel Costs

Travel costs to and from work represents a significant cost to workers in terms of both time and money. The following table illustrates this using data from the 16 worker representative interviews.

Segment of Industry	Average travel cost per month	Average travel time to work (one way)
High Productivity Segment (n = 9)	R228	39 minutes
Low Productivity Segment (n = 7)	R114	29 minutes
All (n = 16)	R178	35 minutes

The lower average cost for the Low Productivity Segment interviews is a reflection of the average shorter travel time to work for the interviews and the fact that three interviewees in this segment walked to work (taking between 20 and 40 minutes).

Wages and Dependency Ratios

With one exception, all the 16 interviewed worker representatives used their wages to support other people. These included spouses, children, siblings, parents, and other members of extended families. Some of these family structures had other sources of income (wages, pensions, and trading). This

income was added to the interviewees take home pay, minus travel to work costs, to calculate the average monthly income available to people supported by workers' wages.

Segment of Industry	Average take home pay minus travel to work costs per month	Average number of people depending on wage (including wage earner)	Average additional income to family structure per month	Average monthly income per person dependent on wage
High Productivity Segment (n = 9)	R2,324	7.4	R844	R428
Low Productivity Segment (n = 7)	R1,340	5.3	R420	R332
All (n = 16)	R1,894	6.5	R659	R393

Wage earners in the Hgh Productivity Segment of the industry have a higher number of dependants than wage earners from the Low Productivity Segment. While the sample size is small this would appear to be consistent with our understanding of dependency among extended family structures in which individuals congregate around resources.

This greater number of dependants on those in the High Productivity Segment of the industry is, in part, offset by the higher incomes in this sector and a higher average source of other incomes.

Additional income is relatively small compared to the wage of interviewee, 25.8% for all interviewees and their dependants.

Working Conditions

The Nature of the Work Involved

For the majority of workers in the VCB industry (operators and packers) the work is highly repetitive. With the exception of one company in the High Productivity Segment of the industry, there is no opportunity for workers to exercise control over the work environment and almost no opportunity for career advancement.

Shifts

All companies producing plastic bags operate shift systems. This means that many workers in the industry work unsociable hours. This is generally compensated with a shift allowance (the MEIBC

Main Agreement stipulates an allowance of 7.5% for afternoon (evening) shifts and 15% for night shifts). Whether this compensates adequately for the disruption to family life that shift systems cause is impossible to calculate.

Where companies operate a two-shift system workers are required to operate 12-hour shifts. Companies operating a three-shift system also require workers to operate 12-hour shifts over some weekends if 24-hour production is to be maintained seven days a week.

In addition to these twelve-hour shifts, travel time to and from work must be taken into account. Within a work environment that is noisy, involves moving machinery, and is often subject to varied temperatures, such shifts are stressful. In an environment that has potential dangers, concentration is difficult to maintain.

Health and Safety

The main health and safety issues encountered in VCB manufacture are injuries resulting from fingers and hands been caught in machinery, damage to feet from dropped objects, and exposure to solvents during printing. This latter health hazard also poses a risk of burns.

In most cases the shop stewards interviewed were not health and safety officials and as a result reliable data on health and safety was only obtained from seven sites (the five High Productivity Segment sites, and two sites in the Low Productivity Segment of the industry).

The following table details key health and safety features at these sites.

Site	Accidents in last 12 months	Last Department of Labour H&S inspection	Does the H&S Committee meet regularly?	Outstanding H&S issues being attended to?	What provision is made for health care by the company?
High Productivity Segment (n = 5, with 766 employees)					
1	Some minor	2001	Yes	Yes	P/T doctor and nurse
2	Non	Not known	No	Yes	P/T doctor and nurse
3	One (hand broken)	2001	No	Yes	Local clinic
4	Non	2001	No	No	Local clinic for which workers pay R2.60 weekly
5	One minor	Not known	No	Yes	Local clinic
Low Productivity Segment (n = 2, with 147 employees)					
6	Six Three serious, two involving loss of fingers, one burn requiring one month off work	2001	No	No	P/T nurse and local clinic
7	Two One damage to finger, one damage to foot, both required three weeks off work	Not known	No	No	Local clinic

From the data collected accidents appear to be more common in companies in the Low Productivity Segment of the industry. This could be due to the greater labour intensity in this segment.

With the exception of one site in the High Productivity Segment of the industry Health & Safety Committees are not meeting regularly.

In the High Productivity Segment of the industry this would appear to be largely offset by action taken by management in conjunction with the Department of Labour's Health and Safety Inspections. In the Low Productivity Segment of the industry action on the part of management appears to be more limited.

Training

Worker representatives were asked about training relevant to their work and whether this contained any off-the-job components.

Segment of Industry	Did vocational training include any off-the-job components?
High Productivity Segment (n = 9)	3 Yes 6 No
Low Productivity Segment (n = 7)	0 Yes 7 No
All (n = 16)	3 Yes 13 No

At the level of operators, (which this sample represents) it would appear that little other than on-the-job training has occurred in the industry. This limits the ability of workers to formally transfer skills to other employment.

Relationships Between Management and Workers

Shop stewards in all the companies where in-depth interviews took place indicated that there were regular meetings between management and shop stewards. In the High Productivity Segment of the industry this sample represents the whole population (of sites) and is therefore an accurate reflection. At the Low Productivity Segment the sample is only a small proportion of the population and, with respect to this question, is biased since interviews were only conducted in unionised sites where management was willing for such interviews to be conducted.

Migrant Workers

Worker representatives were questioned over their willingness to relocate in the event of retrenchment to help ascertain the impact of any job losses resulting from the proposed regulation.

In fact, questions on their housing situation revealed that many (11 out of 16 or 69%) were already migrant workers with permanent homes away from the area of their employment.

This prevalence of migrant workers resulted in part from continued influence of apartheid migrant labour policies with a number of workers having permanent homes in the former homelands and TBVC ‘states’. It also resulted from early retrenchment processes in the industry and the offering of jobs to workers within the company but in a different location that had been accepted.

The impact of migrant work on family life and as a risk factor in the spread of HIV/AIDS is understood but is not possible to quantify.

Prospect of Re-employment

Worker representatives were asked what they thought their opportunities for re-employment were should they be retrenched from their present positions.

Fifteen out of the 16 interviewees indicated that finding alternative employment using their current skills would be difficult, very difficult, or impossible. Only one employee thought that finding alternative employment would be easy based on his experience.

Interviewees suggested a number of reasons as to why finding alternative employment would be difficult for them should the proposed regulations result in the closure of their company. These included:

- The high level of unemployment in South Africa.
- That their experience would not be relevant if the industry was closed down
- That companies in other industries had negotiated re-employment agreements with retrenched workers and that, in the event of an economic upturn, it would be these workers who would be employed.

The arguments put forward by shop stewards are entirely consistent with our knowledge of the South African labour market. Statistics South Africa estimates that the official rate of unemployment stands at 23.3% and an additional 12.9 % of the population are unemployed but have given up looking for work and do not therefore fall into the official definition of unemployment. Unemployment rates among low and semi-skilled Africans (i.e. most workers in the VCB industry) are even higher than these national averages[17].

Consistent with the number of employees who were already migrant workers, 14 out of the 16 interviewees indicated their willingness to move within the RSA if necessary to find employment as long as this employment allowed them to earn a living. As one shop steward put it, 'I'll move anywhere in South Africa *but* where I can earn a living.'

A number of shop stewards pointed out that they represented a biased sample with respect to these questions since, as shop stewards, they tended to be better educated and generally have more initiative than rank-and-file workers.

[17] Statistics South Africa. 2001. *South Africa in Transition: Selected Findings from the October Household Survey of 1999 and Changes that have Occurred Between 1995 and 1999. Pretoria.*

Re-employment Estimates by Employment Category and Industry Segment

Taking this information into account, the following table estimates the likelihood of employees in the VCB industry finding alternative employment by employment category and by segments of the industry.

Employment Category	Percentage of High Productivity Segment Employment	Percentage of Low Productivity Segment Employment	Would Employees find re-employment?
Film blowing	12	23	No
Printing	9	11	No
Bag Making and Packing	42	39	No
Recycling	2.2	4.4	No
Mixing	1.6	2.1	No
Distribution and Transport	8.5	5.9	50% Yes
Artisans	4.0	0	Yes
Supervisors	1.6	3.3	High Productivity Segment: Yes Low Productivity Segment: 50%
Administration	2.9	3.0	Yes
Management	4.2	8.2	Yes
Other employment Categories	11	1	50% Yes
Percentage that would not find re-employment	76.6	84.6	

Worker Representative Perspectives on the Proposed Changes

At the end of the worker representative interviews shop stewards were asked if there was anything they would like to say about the proposed regulations on plastic bags and how it might effect workers in their company. While their responses to this opportunity reflected fear and anger at the situation they found themselves in, they also strove to provide considered and balanced responses to the wider issues involved. Additionally, they sought to suggest, often creatively, alternative solutions to the regulations.

Workers in the VCB industry are likely to bear the brunt of any industry restructuring as a result of the proposed regulations. This section attempts to present the voice of their representatives as directly and clearly as possible.

Fear

Within the context of mass unemployment and the absence of an adequate social security system the overriding concern voiced by shop stewards was the fear of poverty that would result for them and their dependants should they be retrenched.

Anger over a Lack of Consultation and Consideration

A number of shop stewards expressed anger over what they felt was a lack of consultation over the proposed regulations. They had heard about the regulations either through their employees or their union. As a result a number of shop steward committees had written letters to the Government or the press and provided copies of these to the researchers.

However, the researchers' presence in their factories represented the first time that they felt a channel was been made available for their voice to be heard directly by government after a year of uncertainty and worry. A number of shop stewards made impassioned plea's that their views be conveyed to the Minister [of Environment and Tourism].

> "The Minister did not think about us workers and the effect it [the regulations] would have on us. Ninety percent of what our company produces is VCB bags. If he goes ahead [with the regulations] ninety percent of employees will be out of work. He must bear in mind that each employee has a minimum of six or seven dependants. They are fully dependent on us."

Regulation

A number of shop stewards pointed out that the proposed regulations on the thickness of plastic bags were not the first set of regulations to effect the industry. Opening up South Africa to imports of cheaper and thinner bags had already put pressure on their companies. They pointed out the irony that in responding to the importation of thinner bags from overseas they now faced regulations that would force them to reverse this response.

Shop stewards pointed out that many of the countries from which these thin plastic bags were imported came from countries without the same level of labour regulations as South Africa. They felt that this was unfair.

> "We want the Minister to be clear on globalisation. If he wants to regulate [the domestic industry] how will he regulate those from the Far East selling bags here?"

The Impact of Retrenchments

Practically all shop stewards raised the likely impact of retrenchments on workers. A number pointed out the government would lose tax revenue if workers lost their jobs. Their more pressing concern was the impact that retrenchment would have on workers and their families.

> "The government must realise that it is not only about people on the shopfloor. It is about their families; there are mouths behind them."

In addition to the likelihood of hunger (which given the data collected on income and dependants would appear to be a real and not figurative outcome of retrenchments for workers in the VCB industry) shop stewards were also concerned about other effects of unemployment. These included increased crime, the break up of families, and the inability of children to continue education – a result that they pointed out would exacerbate the problem of unemployment.

Suggested Alternative to the Problem

Not all shop stewards were clear as to the reason for the regulations and on occasion there were internal debates during group interviews. However, the majority saw the regulations aimed at reducing litter.

Shop stewards recognised the 'need for a clean country' however they stressed that regulations to achieve this needed to be balanced against the impact of those regulations on employment.

A number of alternatives to the proposed regulations were suggested by these shop stewards. These included; educating people as why they should help keep the country dean by not throwing away rubbish, creating jobs through litter clearing schemes, and encouraging recycling of plastic bags that would create additional employment. One idea was that school children be encouraged to collect bags that would otherwise litter the country, which their school could then exchange for books.

6.3 The retail industry

The retail sector was divided and dealt with in two sectors.

6.3.1 Large retail groups, that use predominantly printed bags

For the large retail sector it was found that 100% of the grocery retailers used 17/18 micron vest type carrier bags at checkout. Importantly the large retailers tended to have a large range of checkout carrier bags therefore the sum of percentages is greater than 100. It was found that 100% of the bags were printed.

Large retailers indicated that the most preferred carrier bags were the 17/18-micron vest type carrier (71.43%) and the 30-micron bags (28.57%, which are extensively used by clothing retailers). The primary drivers for both bags were found to be both functionality and cost. In follow up interviews with retailers of foodstuffs, the use of virgin polymer was found to be essential.

Large retailers indicated that the least preferred types of bags were the 80-micron (42.86%), paper (28.57%) and cloth (14.29%) primarily due to the cost of the bags.

6.3.2 Smaller retailers, which use a combination of printed and "plain" VCB's

For the small retailers 80.90% used check out carrier bags broken down as presented in the table below. Importantly 19.09 % of retailers surveyed did not use checkout carrier bags.

Bag type	Percentage use
17/18 micron unprinted	42.17%
17/18 micron printed	23.61%
30 micron printed	5.83%
Paper	3.98%
30 micron unprinted	2.92%
80 micron	2.39%
Cloth	0%
Total	80.90%

Mean monthly consumption figures were determined for the various types of bags used by small retailers as detailed in the following table.

Bag type	Mean monthly consumption per outlet (bags/ month)
17/18 micron unprinted	8309
17/18 micron printed	
30 micron	1319
80 micron	2387
Cloth	-
Paper	1828

The cost of carrier bags for small retailers is listed below:

Bag type	Weighted Mean Cost (Rand/ 1000 bags)
17/18 micron unprinted	R 59.66
17/18 micron printed	R 78.26
30 micron	R 113.00
80 micron	R 275.00
Paper	R 192.00
Cloth	-

6.3.3 Imports in the retail industry

In the large retail sector, no respondents made use of imported carrier bags. It has however come to light that one of the larger retailer groups are important significant amounts of printed bags. For the small retailers however there were 3 users of 17/18 micron bag users using 7500 imported bags per month. In addition two 30 micron bag users using 4000 imported bags per month. Pricing information could not be uniquely identified for the imported bags as they did not represent 100 % consumption, and indications are that many small retailers are using imported bags without being aware of it.

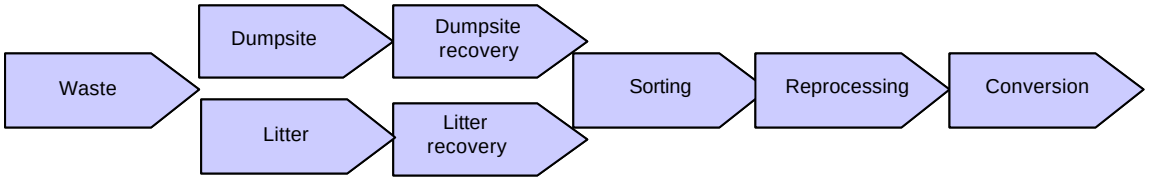
One large retailer was using cloth bags. The price per 1000 bags was R 7 000 for internationally produced bags and R 8 500 for locally produced bags. No small retailers were identified as using cloth bags.

6.3.4 Reuse and recycling in the retail industry

The prevalence of recycling of post consumer carrier bags has been found to be very low. Large retailers indicated that recyclers are not able to collect and recycle carrier bags from stores as this would not be cost effective. In support of this, 87% of 17/18 micron bag users indicated that there was no provision made for recycling of plastic bags. However 51.41% indicated that the reuse of 17/18 micron bags was actively encouraged.

6.4 Waste, including recycling

The key post consumption activities associated with VCB's are depicted in the following diagram



This research identified 85 companies whom are at present recycling plastic. There are only two of these that recycle post consumer VCB's. A thorough analysis of the current plastic recycling industry, and in particular the potential of the industry to recycle post consumer VCB' could not be done due to a lack of data. The findings of this section therefore had to rely heavily on other sources of information, such as prior studies conducted and general industry knowledge.

6.4.1 Applications for recycled plastics

The application for recycled polymer is generally categorised as follows (List not intended to be exhaustive)

- Film for building, agriculture, garbage bags, stretch wrap, shrink wrap and carry-out bags
- Pipes and hoses for the agricultural, industrial, mining, plumbing, garden hose, and other markets
- Other than for pipe many other profiles are also made from recyclates. This includes shoe and suitcase welting, assembling and decorative profiles and wire handle grip.
- Injection moulded products such as kitchen utensils, cups, industrial storage bins, shoe soles, refrigerator trays, etc.
- Roto-and compression moulded products such as garbage bins, floor coverings, outer covers for lead-acid batteries, etc.
- Blow moulded products such as bottles, containers and toys

In determining why such a low percentage of HD-VCB's enter the recycling process, a number of factors must be considered from both a supply and demand perspective.

6.4.2 Plastics recycling, and specifically HD-PE recycling

It is estimated that the total HD-PE recycled in South Africa in 1995 was 20 265[18] tonnes. This constitutes 18% of all plastics recycled, and approximately 16% of total HD-PE produced.

[18] Research report "The potential of using fiscal instruments to promote the recycling of plastic waste in South Africa" conducted by Deloitte and Touche for DEAT, 1995

It is however estimated that less than 1%[19] of high-density polyethylene VCB's manufactured is recycled after use. The relative amount that ends up as litter versus the amount that ends up in a dumpsite is unknown.

The reasons for the relative low recycling of VCB's compared to other HD products, can be determined by looking at the demand and supply balances of the market for reprocessed (post consumer) HD.

Demand for reprocessed HD-PE

The demand for reprocessed HD is determined by converters, who in turn base their demand on a number of factors, including:

- The market demand for products that can be manufactured from reprocessed HD-PE. At present it demand is limited to refuse bags (primarily), specific pipes, and carry out bags (limited),
- The technological implications for converters of introducing reprocessed material into their manufacturing process
- The price and availability of virgin polymer.
- The price and availability of reprocessed polymer.

The supply of reprocessed polymer

Based on the market demand for reprocessed polymers, the recyclers inform their collection network on the types and volumes of material required. Collectors have an intimate knowledge of the factors that determine the value of a certain products, and determine the economics of their collection by considering three factors

- The price paid (per kg), which is a factor of demand.
- The contamination (including printing) of the product – highly contaminated material costs more to recycle and is less valuable
- The product weight. This plays a major part in the efficiency of the collection process. The lower the weight, the less viable the collection process.
- The point of consumption, which in the case of VCB's is the domestic market. There are therefore no single points of collection of large volumes of the product available to the collector

[19] Industry estimate

An assessment of the above factors for the current recycling of VCB's explain the low percentage of post consumer VCB's being recycled, as follows:

- From a demand perspective the applications (which determine the market) for post-consumer VCB's are limited.
- The technology used to produce "thin" VCB's restricts the relative percentage of post consumer waste that can be used as raw material input. Variations in thickness, and "bubble brakes" due to inconsistencies in raw material quality as a result of the inclusion of reprocessed material, create limitations on the demand for post consumer reprocessed polymer.
- From a supply perspective the combination of low weight per bag, the high level of print contamination relative to the bag surface, and the lack of single points for collection makes in uneconomical for collectors to pursue VCB's

6.4.3 The cost of recycling

Due to the limited data received from plastic recyclers a detailed cost analysis could not be done. The following are estimated costs.

	Printed	**Unprinted**
Cost of collection (Price paid by recycler)	R 600- 800 per tonne	R 1200 –1500 per tonne
Input cost to converter (Price paid by Converter)	Varies, but R 3400 per tonne can be used as an average	

The difference in the price paid by recyclers to collectors for printed and unprinted VCB's reflect one of the primary constraints to the cost effective recycling of post consumer VCB's, namely the printing on bags. Although it is technically possible to recycle printed bags, additional costs, for example equipment to degasify the material, are incurred. The weight of the printing relative to the bag weight means that the actual material recovered is less than the actual weight of the bag, therefore the lower price paid for printed bags.

Although very little data is available on the current available capacity for recycling, industry sources indicated the following:

- Current capacity is fully utilised
- Additional capacity will require capital investment of approximately R 12 500 per tonne increase.