1. Introduction

Johannesburg Metro houses the head offices and major sales/distribution operations of almost all the global firms located in South Africa. But Ekurhuleni has a far greater concentration of manufacturing firms than Johannesburg Metro. And, although Ekurhuleni's location is not ideal for exports to the European, North American and Asian markets, it is a competitive site for access to African markets; Johannesburg also has a history of technological development of mining and minerals beneficiation and the high levels of skills, engineering support and specialized facilities (external economies of scale), which are usually available in the Metro, makes it well suited to the development and manufacture of high-tech performance chemicals. Although the survey data reveals that firms have generally performed well over the survey period, particularly export orientated firms, eradication of the constraints identified will go a long way in increasing the sector's competitiveness, and elevating and sustaining growth.

An overview of the structure and national trends within the sector is followed by an analysis of Ekurhuleni's performance in recent years. An assessment of the factors underpinning performance then guides local government policy.

1.2 Composition of chemicals sector

The chemical industry is amongst the most important manufacturing activities in South Africa, and one of the most complicated of all manufacturing industries involving thousands of different chemical reactions, processes and products. Not only does the sector have an intricate web of internal interdependencies and linkages, but it also interweaves itself into virtually every other aspect of economic activity.

Chemical raw materials include agricultural commodities, coal and tar products, petroleum, metallic minerals, and non-metallic minerals. From a product grouping point of view, the chemical industry produces three broad types of products:

1. organic and inorganic, basic or primary (commodity) chemicals;
2. organic intermediate chemicals; and
3. end or functional organic chemicals.

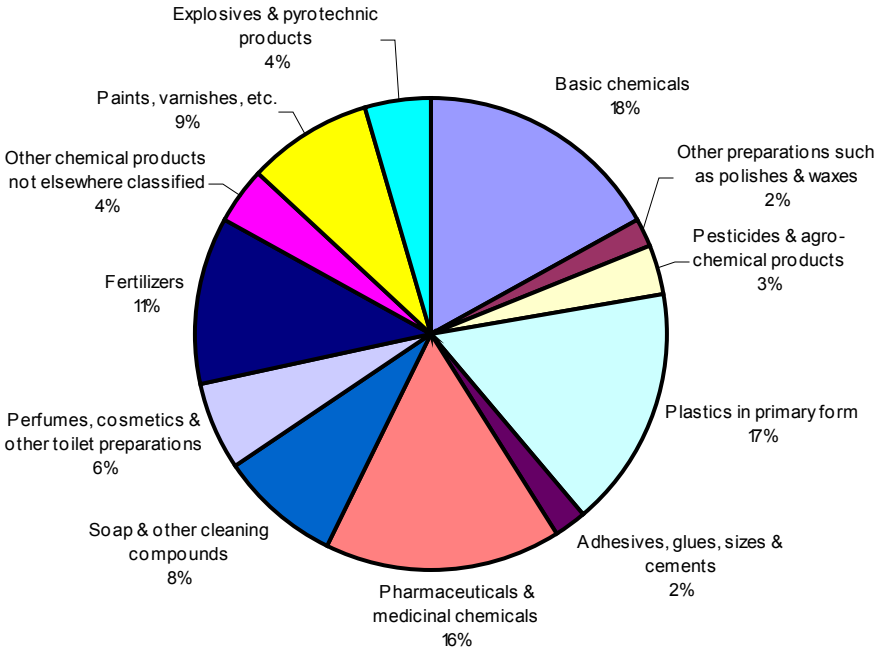
Figure 1 shows the statistical classification for production by Statistics SA. Organic & inorganic chemicals[1], fertilizers & nitrogen compounds and plastics in primary form & synthetic fall in the category of basic chemicals (upstream), whilst the remaining products are classified as other chemicals (downstream). Basic organic and inorganic chemicals, plastics in primary form and of

[1] Basic or primary and intermediate organic and inorganic chemicals

synthetic rubber, and pharmaceuticals and medicinal chemicals are clearly the largest individual contributors to output, accounting for just over 50% of the sector's output.

But the largest number of firms are in the paints and soaps sub-groupings which reflects the lower scale economies in these activities.

Figure 1: Composition of chemicals sector by output



Source: Statistics South Africa, Manufacturing Census, 1996

Ekurhuleni

Just over 10% of national value added output is manufactured in Ekurhuleni (including fuel, petroleum, plastics and rubber products). Contribution to national sectoral employment stands at 16%. If the fuel and petroleum components, which are produced mainly along the coast, are extracted then these percentages will rise quite substantially; fuel and petroleum products make up a quarter of national chemicals and petroleum products output. The sector accounts for one fifth of both geographical manufacturing output and employment.

2. Performance

With nearly 100 000 employees in 2002, the chemicals sector is the fourth largest employer in manufacturing, behind food products, clothing and metal products. And with 11.1% of manufacturing value-added, it is the largest grouping in terms of value created in manufacturing. It has also been one of the better performing sectors, especially the upstream 'basic chemicals' sub-sector. It is thus a crucial industry from the perspective of South Africa's ongoing growth path and has been identified by policymakers as an important sector in advancing South Africa's social economic development objectives.

2.1 National trends

Over the past five years, this sector has recorded an average annual value-added growth of 4.3% with both sub-sectors recording positive growth. The recent more rapid growth in basic chemicals is probably due to beneficiation in intermediate chemicals. Indications are that growth in other chemicals is related to products such as soaps, cosmetics and beauty products, as well as paints; the IDC has received a number of requests for funding in these areas and there have also been recent new entrants.

Figure 2: Output

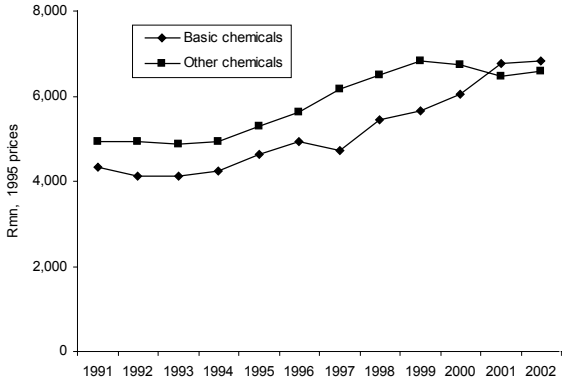
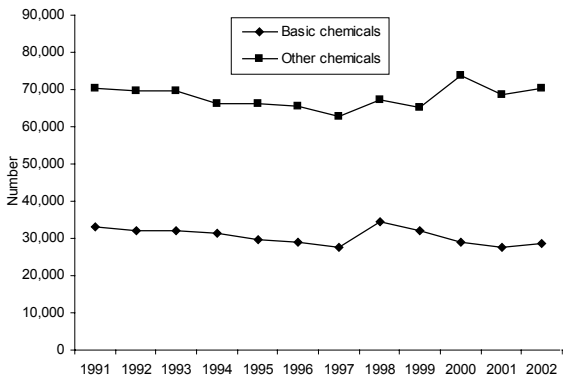


Figure 3: Employment



Source: TIPS Standardised Industrial Database

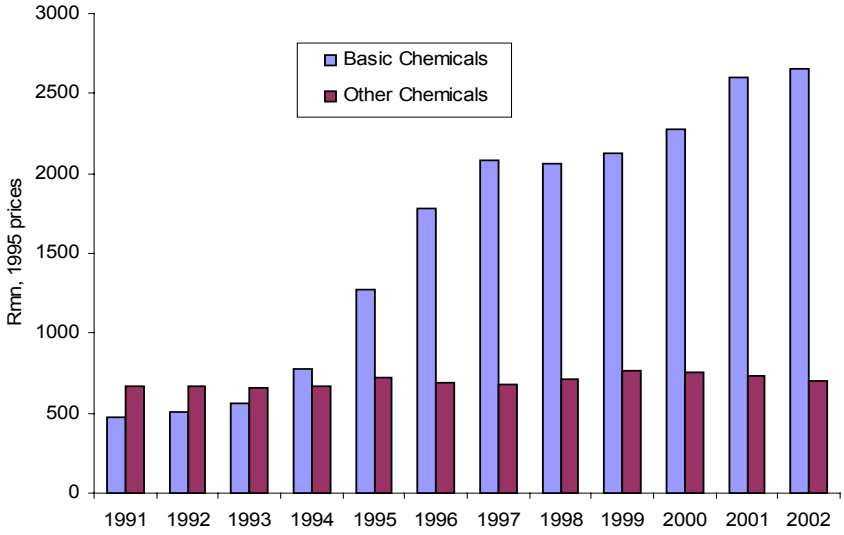
The two sub-sectors have followed divergent paths in employment in recent years. While basic chemicals has shed labour in most years, the growth in the other chemicals sector in the second half of the 1990s has been accompanied by increases in employment, albeit with yearly fluctuations (Figure 3). Encouragingly, employment in basic chemicals grew marginally in 2002, following three consecutive years of declining employment levels. For the sector as a whole, an

average annual growth rate of 2.1% was recorded over the past five years. This is significant in the background of falling employment levels in manufacturing as a whole.

Both sectors employ a large proportion of highly skilled and skilled labour, and have seen the mix move gradually towards higher skills, although not to a particularly significant extent. Declining levels of employment in basic chemicals are largely attributed to restructuring at Dow Chemicals and AECI.

Real investment is cyclical in other chemicals, fluctuating in a narrow band of R0.66bn – R0.77bn. The big investments in basic chemicals reflect the large and lumpy nature of investments in this sector and the access to capital of a firm such as Sasol, especially given continued IDC financing in the 1990s. Because the South African market is small by international standards, investment usually occurs if the product has global markets, which is the case upstream. While increased output of basic chemicals has been accompanied by large investments and an increasing capital intensity of production, the growth of output and value-added of other chemicals has been accompanied by no increase in capital intensity over the period as a whole.

Figure 4: Investment (Gross domestic fixed investment)



Source: TIPS Standardised Industrial Database

The investment patterns do raise a major question around patterns of industrial development. Given the abundance of labour in South Africa, it would be hoped that more investment in expanded capacity would take place in more labour-intensive operations. This is not what has occurred. To an extent the patterns reflect the ongoing significance of previous decisions. Despite relatively expensive capital and an abundance of labour, state support has created a

competitive upstream (and capital-intensive) sector. This competitive advantage continues to justify further investment in the sector, despite the increasing capital-intensity coinciding with employment reductions alongside higher output. This further reflects the under-development of the downstream sector relative to the well-developed upstream sector.

Following a period of robust export orientation in the first half of the 1990s (the export-output ratio peaked at 50% in 1997), local demand has now become the main absorber of domestic output in basic chemicals (the ratio declined quite substantially to just below 40% by 2002). While the importance of exports has also increased for other chemicals, they amounted to just below 9% in 2002. And while the basic chemicals exports are generally to industrialised countries, an increasing amount of other chemicals exports are to other African countries

Figure 5: Export-output ratio

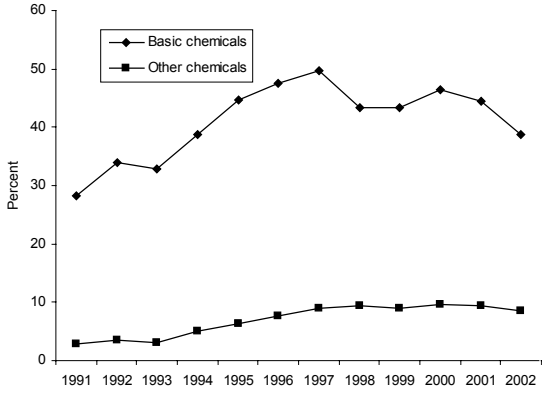
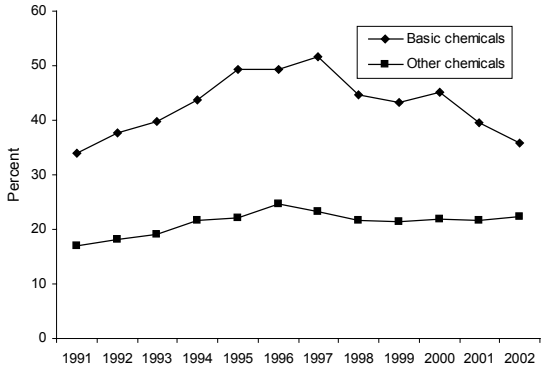


Figure 6: Import-domestic demand ratio



Source: TIPS Standardised Industrial Database

Labour productivity is the value added per unit of labour. And, labour productivity growth with major investments in higher levels of capital stock has improved strongly in basic chemicals suggesting more efficient production. The lackluster performance in other chemicals after the mid-1990s possibly indicates a need for upgrading of both capital stock and labour skills in other chemicals (the improvement in the skills profile over the entire period has been insignificant in both sub-sectors).

Figure 7: Labour productivity

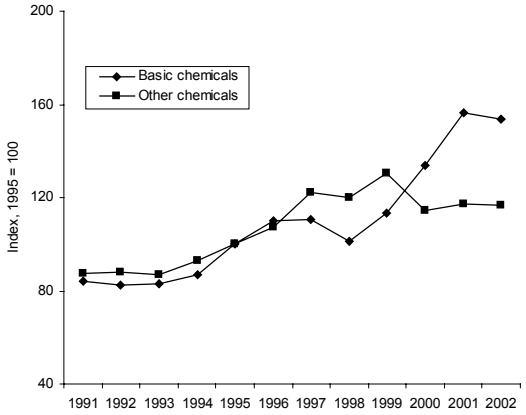
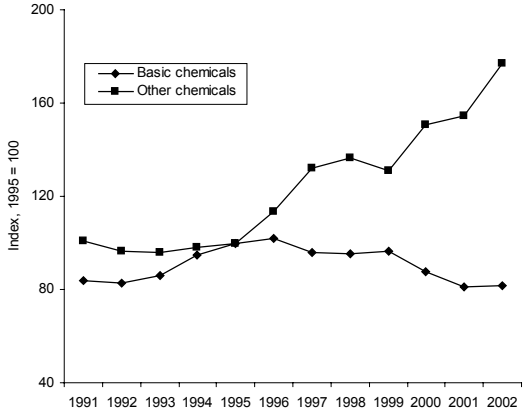


Figure 8: Capital Productivity



Source: TIPS Standardised Industrial Database

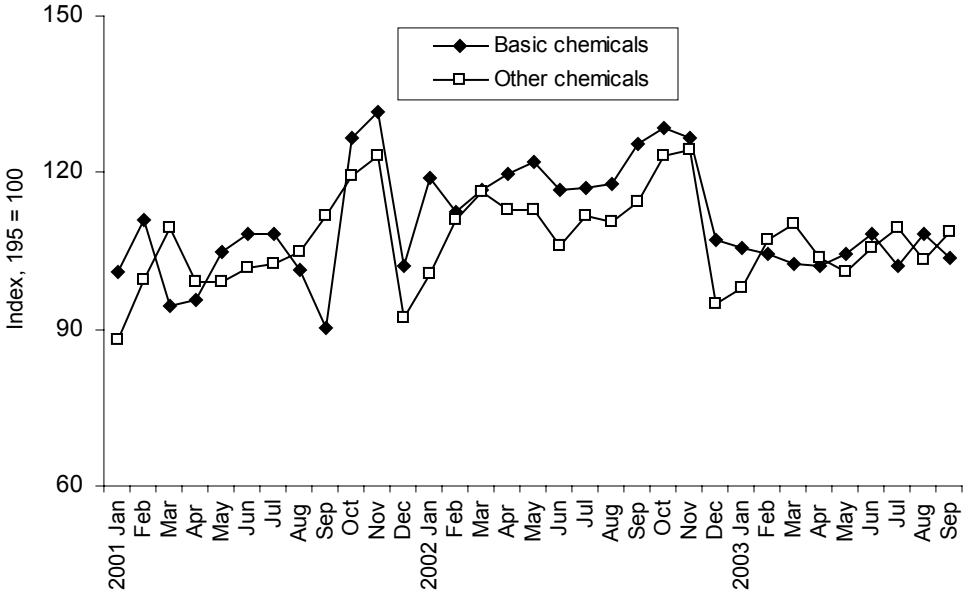
While the nature of operations means plants are kept running at close to full capacity at all times, the new investment has coincided with steady capital productivity levels in basic chemicals (Figure 8). Productivity levels are expected to improve again as plants are debottlenecked. Furthermore, as the local economy grows, less production will have to be exported and sold at prices significantly below those in the local market. Higher average revenues from the output will raise productivity levels. The rising capital productivity in other chemicals can be explained by employment growth accompanied by successive declines in the growth rate of capital stock.

Short-term developments

With both the export-output and import-domestic demand ratios falling in 2001 and 2002 (Figures 5 and 6), the generally higher volumes of domestic output in basic chemicals, in the respective years can be attributed to increased domestic absorption. The subsequent slide in output coincides with rising interest rates and rand appreciation towards the end of 2002, suggests a failure to adjust prices in line with the strengthening in the rand; prices appear to be sticky downwards. Although somewhat volatile, recent production data shows a tendency of stabilization.

Evidently, monthly production is influenced by seasonal factors; output usually rises for most of the year and firms cut back at the end of the year. However, the soft recovery in 2003 also suggests that tighter monetary policy and rand strength have also impacted negatively on this sub-sector. Some firms downstream do not pass on the benefits of rand depreciation and, particularly, appreciation in the domestic currency, onto customers partly because of the uncertainty of the sustainability of the currency at these levels; customers are also sensitive to price instability.

Figure 9: Production of chemicals, indices of physical volume of production

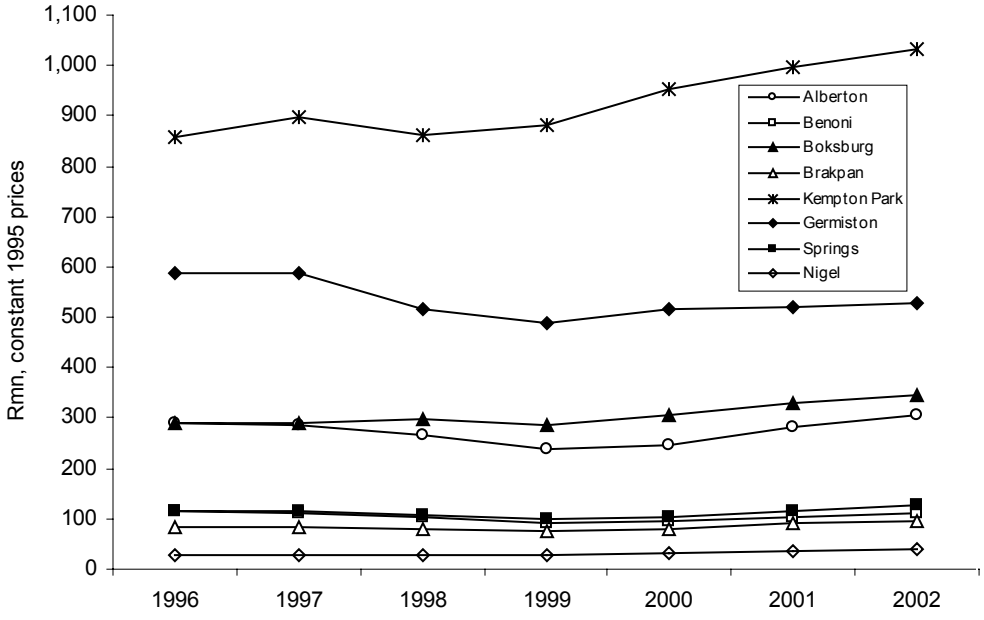


Source: Statistics South Africa

Note: Data are seasonally adjusted

2.2 Performance of industry in Ekurhuleni

Figure 10: Gross geographic value-added of chemicals & related products[1]



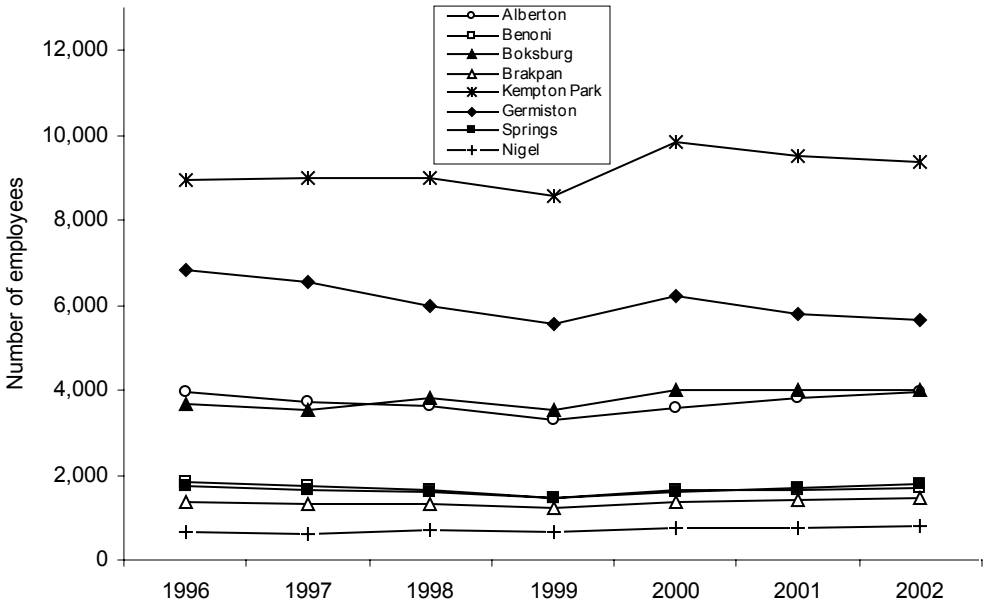
Source: Global Insight

[1] An amalgam of chemicals, fuel, petroleum and rubber products

Metro level chemical data is aggregated together with fuel, petroleum, plastics and rubber products. Kempton Park is clearly the hub of chemical production in the Ekurhuleni Metropolitan municipality, followed by Germiston which creates only half the value-added produced by Kempton Park. And growth in value-added has also been much stronger in Kempton Park, raising its contribution to Ekurhuleni output from 36% in 1996 to 40% in 2002. With value-added expansion in 2002 more than double the rate recorded at national level, the rest of the economy's value-added output probably contracted (bear in mind that the national and metro data do not measure the same chemical activities). Recent national data suggests that Ekurhuleni value-added shrunk in 2003 given its relative importance.

Regional employment weightings reveal a similar pattern to value-added contributions (Figure 12). In 2002, Kempton Park was the largest employer, accounting for 33% of Ekurhuleni's employment, followed by Germiston (20%). Employment levels declined consistently between 1996 and 1999 with just over 10% of employees being retrenched over this period. Not surprising, the increases in employment across the various production sites in 2000 are very much in line with the national data for other chemicals as the largest number of firms in this Metro are in downstream activity. With recent production data showing a contraction in output in the first nine months of 2003, the small recovery in employment in 2002 is likely to have been reversed in 2003.

Figure 12: Employment in chemicals & related products[1]



Source: Global Insight

[1] An amalgam of chemicals, fuel, petroleum and rubber products

3. Analysis of key factors underpinning performance

The two sub-sectors constituting the chemicals sector are quite different in many respects. A well-developed upstream industry is dominated by a few large firms in contrast to an under-developed downstream industry consisting of a large number of relatively small firms. In this background, the factors underpinning performance in basic chemicals differ from those in other chemicals.

Import parity pricing by upstream firms inhibits the competitiveness of firms downstream. An example is the 10% margin on titanium which makes up 50% of the cost of paint sales. This markup, however, is substantially lower than that of some plastic inputs. Further import tariff reductions are proposed to bring down the prices of inputs subjected to import parity pricing.

Although Industries in this sector are intertwined, there is a need for a stronger link between R&D and industry (strengthening of national innovation system), better downstream and upstream linkages, skills development, improved foreign and local links, increasing specialization in niche products and an upgrading of production and organisational methods to ensure competitiveness and sustainable growth of this sector.

3.1 Linkages: inputs and major markets for output

Industries in this sector are strongly intertwined with substantial portions of each industry's inputs being sourced from the sector. Allied industries such as petroleum and coke, and other mining products are also major inputs. Electricity and transport are important inputs, with basic chemicals, in particular, being energy-intensive.

Basic chemicals

While most basic chemicals inputs come from within the sector and outputs are used by the sector, the other users include downstream manufacture led by fertilizer.

Table 1: Major inputs to basic chemicals industry

Source	***Rmn***
Basic chemical products	1180
Other services/activities	693
Transport services	650
Electricity	350
Other business services	279
Other mining products	273
Petroleum products	271
Primary plastic products	146
Insurance services	136
Other special machinery	114
Other	825
Total inputs at purchasers' prices	4 917

Source: Statistics South Africa, Supply & Use Tables 2000

Table 2: Main markets for basic chemical products

User	***Rmn***
Basic chemical products	5613
Other services/activities	543
Fertilizers	495
Other business services	135
Trade services	116
Soap products	106
Animal feeds	95
Primary plastic products	49
Real estate services	43
Paints	21
Other	89
Total supply at basic prices	7305

Source: Statistics South Africa, Supply & Use Tables 2000

The primary plastics industry is very much within the petrochemicals complex with inputs derived ultimately from coal or oil (from the coastal refineries). The vast majority of outputs are used by the industry for further processing (see plastics paper for a detailed analysis).

Table 3: Major inputs to primary plastics industry

Source	*Rmn*
Basic chemical products	1844
Primary plastic products	1147
Petroleum products	1113
Electricity	419
Other services/activities	407
Transport services	336
Other business services	244
Other special machinery	198
Other mining products	193
Other chemical products	186
Other	986
Total inputs at purchasers' prices	7073

Source: Statistics South Africa, Supply & Use Tables 2000

Table 4: Major users of primary plastics industry's output

User	*Rmn*
Primary plastics	7703
Basic chemical products	1315
Other services/activities	215
Other business services	163
Trade services	152
Pesticides	34
Fertilizers	2
Real estate services	2
Other	-
Total supply at basic prices	9586

Source: Statistics South Africa, Supply & Use Tables 2000

Figure 5: Major inputs to fertilizers industry

Source	*Rmn*
Other mining products	1498
Transport services	452
Basic chemical products	411
Fertilizers	393
Other services/activities	165
Other business services	132
Other special machinery	99
Plastic products	92
Other chemical products	89
Pesticides	72
Other	405
Total inputs at purchasers' prices	3808

Source: Statistics South Africa, Supply & Use Tables 2000

Table 6: Major users of fertilizers industry's output

User	*Rmn*
Fertilizers	3954
Basic chemical products	725
Other services/activities	155
Pesticides	124
Other business services	87
Trade services	82
Animal feeds	33
Real estate services	4
Other	-
Total supply at basic prices	5164

Source: Statistics South Africa, Supply & Use Tables 2000

The product range produced by the basic chemicals sector of which these three sub-groupings are part is of such a nature that it is of limited use to households; less than 1% of basic chemicals output is used for final consumption.

Other chemicals

There are several interesting features in this sub-sector. Firstly, as with basic chemicals, each industry is reliant on its own outputs as inputs. Secondly, basic chemicals are a major source of inputs. Thirdly, associated industries to the chemicals sector, such as petroleum products, are important input providers to the other chemicals industries.

Table 7: Major inputs to pesticides industry

Source	*Rmn*
Pesticides	928
Other services/activities	168
Other business activities	105
Other fabricated metal products	46
Plastic products	41
Basic chemical products	36
Other chemical products	36
Petroleum products	23
Trade services	18
Transport Services	17
Other	79
Total inputs at purchasers' prices	1497

Source: Statistics South Africa, Supply & Use Tables 2000

Table 8: Major users of pesticides industry's output

User	*Rmn*
Pesticides	1663
Fertilizers	68
Soap products	66
Trade services	63
Other business service	32
Other services/activities	5
Pharmaceuticals	2
Other	-
Total supply at basic prices	1899

Source: Statistics South Africa, Supply & Use Tables 2000

There is a relatively wide range of material inputs into soap manufacture, with services also playing an important role. The output, however, is mainly packaged into soap products, although some is used in other applications such as pharmaceutical products. A similar situation is found in paints.

Table 9: Major inputs to soap industry

Source	*Rmn*
Soap products	916
Other chemical products	787
Other business services	717
Other services/activities	664
Basic chemical products	643
Plastic products	633
Paints	429
Other fabricated metal products	296
Oils and fats products	175
Pharmaceuticals	171
Other	1085
Total inputs at purchasers' prices	6516

Source: Statistics South Africa, Supply & Use Tables 2000

Table 10: Major users of soap industry's output

User	*Rmn*
Soap products	8118
Trade services	298
Pharmaceutical products	172
Other business services	152
Pesticides	83
Other chemical products	77
Other services/activities	29
Other manufacturing	23
Paints	13
Basic chemical products	8
Other	-
Total supply at basic prices	8973

Source: Statistics South Africa, Supply & Use Tables 2000

Table 11: Major inputs to paints industry

Source	*Rmn*
Basic chemical products	855
Plastic products	502
Other services/activities	407
Paints	404
Primary plastic products	357
Other fabricated metal products	314
Other business activities	217
Petroleum products	171
Transport services	80
Real estate services	71
Other	402
Total inputs at purchasers' prices	3780

Source: Statistics South Africa, Supply & Use Tables 2000

Table 12: Major users of paints industry's output

User	*Rmn*
Paints	4267
Trade services	158
Other services/activities	148
Other business services	81
Other manufacturing	53
Basic chemical products	23
Soap products	20
Other chemical products	16
Pharmaceutical products	5
Other	-
Total supply at basic prices	4771

Source: Statistics South Africa, Supply & Use Tables 2000

The remaining other chemicals grouping consists of a diverse range of products, but again basic chemical products are the most important single grouping of inputs, and most outputs are used in the other chemicals sector itself.

Table 13: Major inputs to other chemicals industry

Source	*Rmn*
Basic chemical products	930
Other services/activities	440
Plastic products	408
Primary plastic products	329
Non-ferrous metals	239
Petroleum products	233
Other chemical products	218
Other business services	201
Paints	145
Soap products	129
Other	997
Total inputs at purchasers' prices	4269

Source: Statistics South Africa, Supply & Use Tables 2000

Table 14: Major users of other chemicals industry's output

User	*Rmn*
Other chemical products	5001
Other services/activities	217
Trade services	196
Soap products	135
Paints	131
Other business services	100
Pesticides	42
Basic chemical products	37
Real estate services	16
Petroleum products	11
Other	9
Total supply at basic prices	5895

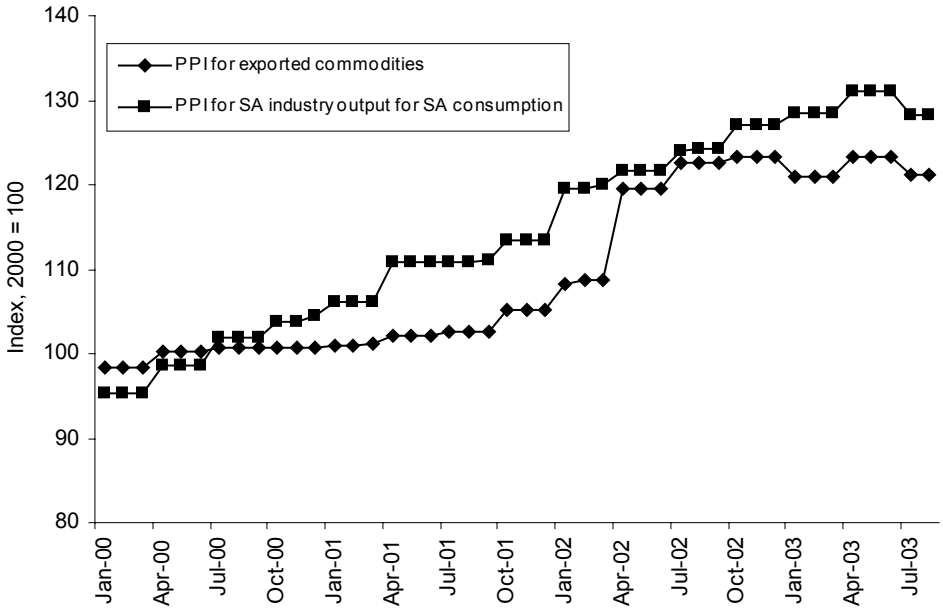
Source: Statistics South Africa, Supply & Use Tables 2000

3.2 Pricing of inputs and the behaviour of large firms

Because of the diverse and complex nature of the sector, an analysis of the pricing of inputs into all chemical industries is not feasible in this paper. The analysis of pricing will be restricted to a number of important industries.

Upstream

Figure 13: Producer prices for basic chemicals



Source: Statistics South Africa

Prices for basic chemical inputs for domestic consumption are generally higher than those for exported commodities. Price adjustment in the former is periodic - except for the period April 2001 to August 2001 – rising at the beginning of each quarter. The first drop was recorded in July 2003. Exchange rate movements are a dominant determinant of local production costs. Increases in input prices of exported commodities are more moderate, with a substantial rise only being recorded after the 9/11 global shock. This indicates that imported inputs are significant in commodities produced for exports.

Downstream

The paints (and associated products) industry, and soaps, cosmetics and fragrances industry are the two largest individual groupings in the chemical sector.

The ***paints*** industry, in particular, has an interesting set of dynamics. Its integration into the global market makes it susceptible to exchange rate movements and changes in international prices of inputs. Domestic firms definitely benefit from rand weakness, which raises export revenues in rand terms, and rand strength tends to erode their profits. However, exports are a relatively small percentage of the industries total output. Currently, an exchange rate of R8/US$ and above, makes exports competitive, and the recent strength of the rand has impacted negatively on exports. Because of the importance of maintaining market share, firms do not tend to immediately raise their domestic selling prices following a sharp depreciation of the domestic currency, and rather opt to sell at lower margins (or a loss) in foreign markets to maintain and possibly capture market share, in anticipation of a reversal of the downward movement of the dollar/rand exchange rate. In the same breadth, firms tend not to pass on the benefits of a stronger rand to local customers as a hedge against possible short-term rand weakness.

Production sites tend to be located close to their inputs and main markets to cut down on both transportation costs and time. Also, the big consumer intermediaries such as Pick ‘n Pay are charged a flat selling price for a product irrespective of where they are located in the country. An extraordinary feature of the domestic industry is that labour is substantially cheaper in South Africa, than in its counterparts, for example, the cost of production is approximately 50% of that of European firms.

Titanium, which faces a 10% import tariff, is an important pigment and the main input into paints (50% of cost of sales). Dulux, a subsidiary of AECI, imports eighty percent of its titanium and the residual is domestically produced. Domestically, titanium is sourced from Richards Bay and processed into titanium dioxide. The world’s two largest titanium dioxide producers are DuPont Titanium Technologies and Millennium Chemicals. Global oligopolistic behaviour is apparently

prevalent in titanium. Amongst the main players are Millennium Chemicals, based in the United States, and Hunstman Tioxide in South Africa. Titanium is priced in foreign currency and its price is determined in international markets. It can either be obtained at international spot prices or contract prices. Hunstman sells titanium domestically, at an estimated 10% margin above the price offered in East Africa. Hunstman probably sets the price high enough to avoid arbitrage. JLM Industries, an importer and local distributor, is Hunstman's main local competitor. Hunstman has been successful in lobbying government against reducing the 10% import tariff. The main local paint companies are not keen on lobbying for a reduction in tariffs because while they will to incur the lobbying costs, all paint firms will benefit; economically, firms should weigh the short-term costs against the potential long-terms benefits.

There is a strong presence of MNCs in the ***soaps, cosmetics and fragrances industry***. Multinational corporations such as L'Oreal, Revlon, Lever Ponds (a division of Unilever) and Colgate are amongst the key firms. With South Africa being well placed for African exports, the existence of economies of scale is an incentive to MNCs. Therefore, like paints, production tends to take place close to its customer base (and input base) to minimize transportation costs and delivery response times.

Although import tariffs have been reduced significantly in some other chemical products, the soaps and cosmetics industries are still highly protected against foreign competition (20% import tariff). The luxury good argument is a basis for this high tariff; although such high tariff duties are not an effective income redistributive mechanism and are perhaps a shortsighted policy because the protection induces (inefficient) production of the same good or differentiated products domestically. Based on the data provided by one of the dominant firms in this industry, it does not seem as if the same type of import-parity pricing, as in paints and plastics, is occurring in major raw material inputs such as sorbitol, ethanol, SCMC and caustic as there would have been sharp price increases in 2002 following the slide in the rand. Instead, there is no consistent picture, and major price reductions have occurred in 2003.

3.3 Trade performance and international competitiveness

Following a period of robust export orientation in basic chemicals in the first half of the 1990s, local demand has now become the main absorber of domestic output. While the importance of exports has also increased for other chemicals, they amounted to just below 9% in 2002 (Figure 5). And while basic chemicals exports are generally to industrialised countries, an increasing amount of other chemical exports are to other African countries. African export growth in industries such as perfumes and cosmetics (21.6%), soaps (14.4%) and pharmaceuticals (12.6%) have outperformed total chemicals export growth (the percentage in brackets are the annual

export growth rates for 2002). The close proximity of South Africa to the sub-Saharan African market makes South African exports more competitive due to lower transportation costs.

Rising levels of output accompanied by falling import penetration and export propensity ratios in recent years, indicate an increasingly self-sustaining domestic upstream chemicals sector (Figure 6). A declining import-domestic demand ratio is an indication of import substitution. With relatively low import tariffs in the sector, local input pricing appears to be competitive by international standards. Import parity pricing, though, makes domestic raw material input prices indifferent from foreign prices, including transportation costs.

The success of the trade policy shift from one of import substitution to one of export orientation has been mixed; an accelerated tariff liberalization programme has been pursued since 1994. Export growth has risen mainly in downstream chemicals where the African market has become increasingly important.

3.4 Development of production capabilities

The majority of employment in upstream chemical production is in the unskilled and low-skilled category rising marginally over the past decade or so; this category made up 46% of total employment in basic chemicals in 2002. This changing skills profile combined with the capital-intensive nature of the sub-sector suggests that machinery is either replacing the less skilled or/and advances in technological capabilities requires an upgrading of skills.

On the other hand, almost 60% of the labour force downstream is skilled, and the skills profile has been progressively shifting over years, and more rapidly than upstream, away from unskilled workers.

Figure 14: Skills profile in basic chemicals

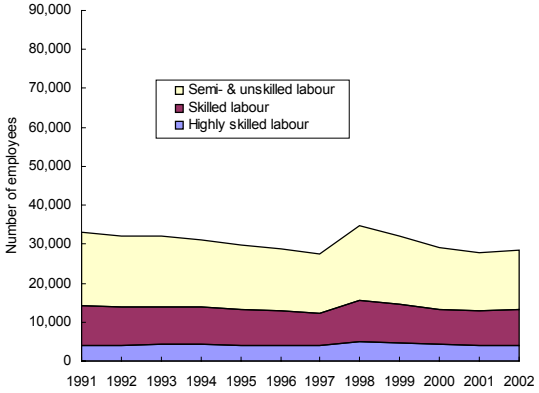
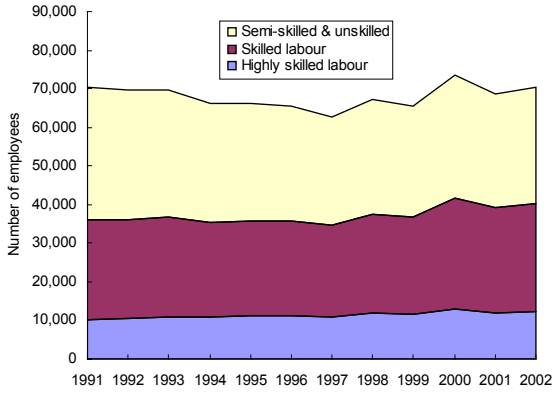


Figure 15: Skills profile in other chemicals



Source: TIPS Standardised Industrial Database

Training appears to be skewed, and to be reinforcing rather than addressing inequalities.[1] Overall, 72% of employees reported not receiving any skills training relevant to work, but among African employees this proportion was 83% while among white employees it was 46%.[2] The heterogeneity of the sector makes it impossible to reach conclusions about skills requirements in each industry. Generally, it appears as if skills are not a significant constraint in the chemicals sector. Retrenchments and recruitments take place across the skills categories, indicating that identification of skills as the bottleneck to employment is misguided. Instead the upgrading of machinery by firms has implications for the specific skills of the workforce. But much of the skills in this context are about using the machinery in question, and therefore largely learned on-the-job.

4. Analysis of Ekurhuleni firm survey data

4.1 Firm performance and market conditions

The number of firms in the chemicals sector responding to the Ekurhuleni survey amounted to 43. Firms are concentrated in the small category, reflecting the low economies of scale in chemicals, with only three falling in the large firm category (Table 15). These firms recorded employment totaling 2819 in 2002, an average of 65 employees per firm. Two thirds of the firms surveyed recorded a growth in employment with no significant disparities amongst the different sized firms.

Table 15: Firm size distribution

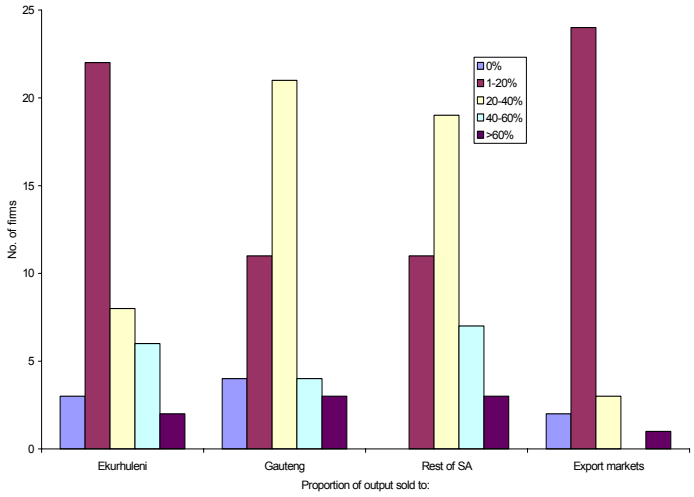
	No. of firms
Micro (0-5 employees)	5
Small (6-49 employees)	25
Medium (50-250 employees)	10
Large (> 250 employees)	3

More than half of the firms had a turnover growth greater than 10% in 2002, in line with all manufactures firms surveyed and well above the growth rates recorded in the previous two years. Only 15% of the firms had a negative turnover rate.

Gauteng is the largest market for Ekurhuleni's chemical sector output. Two thirds of the firms produce for the external or foreign market but only a small number of firms export more than 20% of their output. High turnover growth is more prevalent in firms that have exposure to export markets than those that produce for the domestic market only.

[1] See Machaka, May and Roberts (2002) 'Economic Trends in the Chemicals Industries, and Implications for Skills Development'.

Figure 16: Proportion of output sold to different regions



Both local and export demand have increased over the past 12 months, with stronger growth in the domestic market. Domestically, demand has mainly come from Ekurhuleni itself. The local market is expected to continue being the main driver of demand in 2005, particularly the Gauteng region.

Below 80 percent capacity utilization in three quarters of the firms indicates that there is an existing platform for growth.

4.2 Firm competitiveness

Upward pressure on production costs emanate mainly from labour and raw materials costs. The higher raw material costs again reflect the downward stickiness of prices following an appreciation in the rand. Import-parity pricing could also have exerted upward pressure on input prices.

Table 16: Number of firms recording different changes in production costs

	Negative	0%	0-10%	>10%
Raw materials	3	0	17	21
Interest charges & depreciation	2	5	26	8
Wages and salaries	0	1	22	19
Delivery and marketing	0	0	28	14

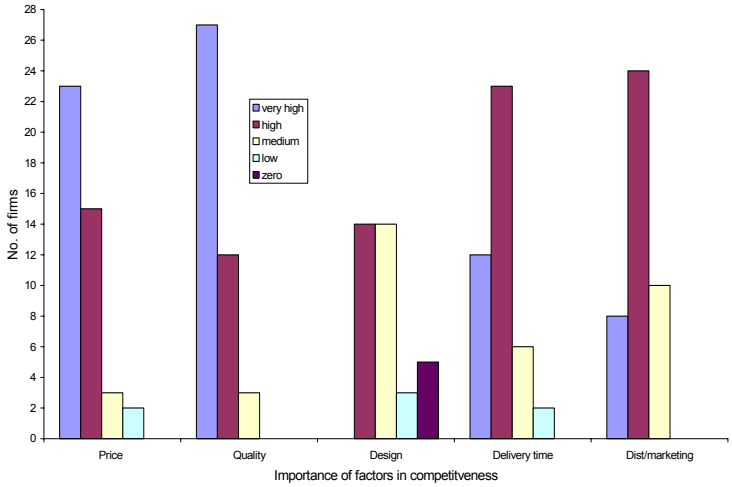
Excessive wage demands tend to suppress employment growth. And the positive relationship between wage increases and turnover is much stronger in chemicals than in plastics; firms with

[2] CASE/Chieta report ' A Demographic Profiles of the Workforce in the Chemical Industries Sector and Sub-sectors', May 2002.

high increases in salaries and wages (increases of greater than 10%) are 78% more probable to have also achieved high turnover growth. Labour productivity (linked to skills profile) is therefore the overriding force that determines turnover rather than remuneration costs.

Price and quality were rated as the most important factors for competitiveness in the chemicals sector. The lower rating for delivery time therefore indicates that South Africa's remote location does not weigh as heavily as one would have expected on its competitiveness.

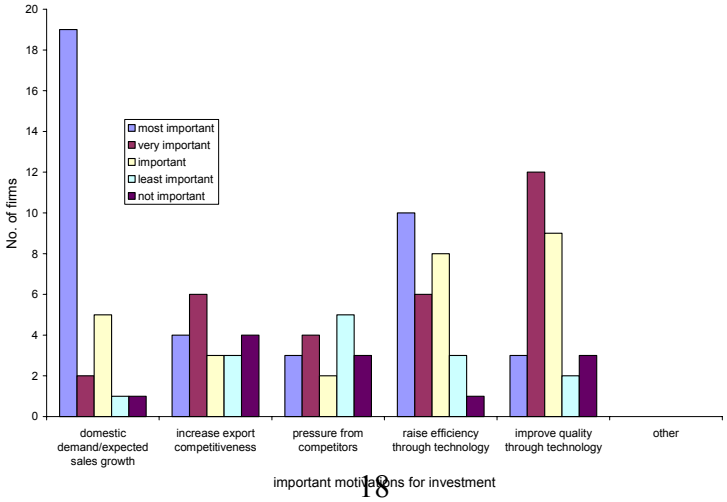
Figure 17: Competitive factors



4.3 Investment and skills development

Although most firms regard up-to-date technology as extremely important, only a small number of firms have modern machinery and equipment. The average age of machinery in half the firms is 5-10 years.

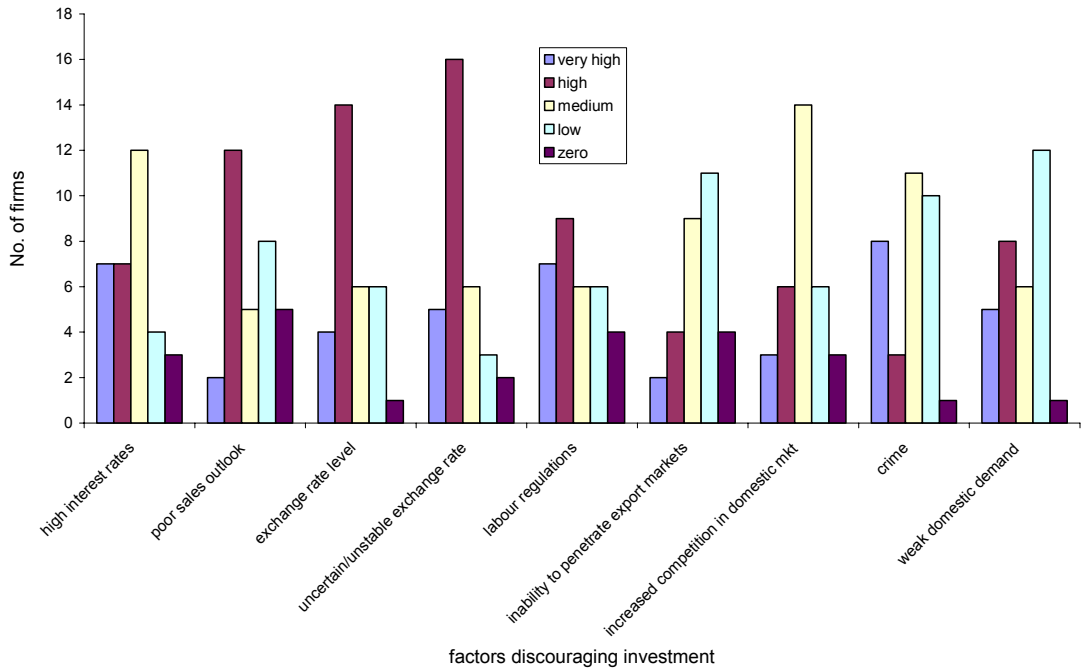
Figure 18: Important motivations for investment



Higher levels of investment spending between 2001 and 2002 by most firms are more or less in line with national trends for basic chemicals, suggesting that the bulk of the investment is probably taking place in firms that produce industrial chemicals rather than final consumption goods (although IDC financing requests and new entrants in soaps and paints also suggest some expansion downstream).

Expected sales growth, raising efficiency and improving quality are the most important motivation for upgrading existing fixed capital.

Figure 19: Importance of factors discouraging investment



Exchange rate level and the associated uncertainty, together with labour regulations are the main investment deterrents; the current labour regulations prevent firms from hiring. Surprisingly, crime does not top the list perhaps suggesting a lower crime rate or/and a step up in security measures by firms in this area.

The workforce is predominantly made up of matriculants and qualifications below matric (43% of firms reported the average level of education as being matric while 40% responded below matric). The poor education profile of workers is not necessarily a bad thing if firms demand mostly semi-skilled and unskilled labour that is trained on-the-job. 58 percent of firms claim back skills

development levy and in-housing training constitutes just over 60% of training costs; total training expenditure by respondents amounted to R30 million in 2002.

4.2 Government policies and incentive schemes

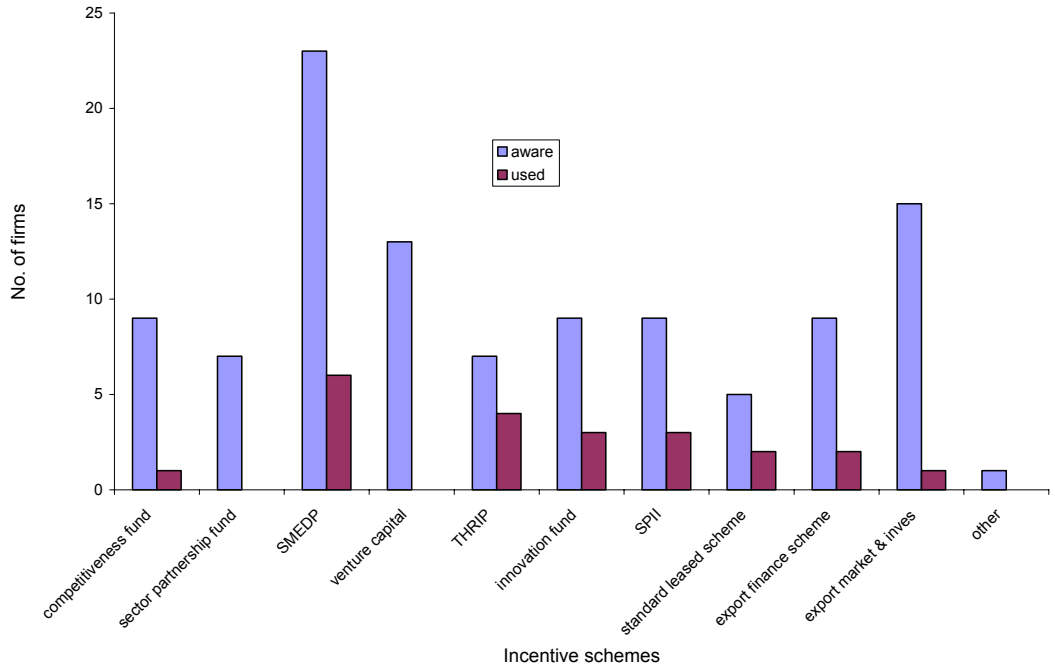
Local economic development aimed at ensuring reliable services (electricity, water, etc.) and reliable and safe public transport were identified as crucial. Ekurhuleni's location in the heart of the continent's economic region, Gauteng, puts less emphasis on promoting the area, with marketing of the area only important to 46% of the firms; the presence of global firms in the metro highlights the Ekurhuleni's status as Africa's major industrial centre.

Table 17: Local economic development policies identified as important

	% of firms
Supporting skills training	69
Marketing the area	46
Ensuring reasonable tariffs	57
Ensuring overall quality of life	81
Ensuring reliable services (electricity, water, etc.)	95
Ensuring reliable and safe public transport	86

Awareness of the SMEDP incentive scheme is more widespread than awareness of other government incentives. Although a small number of firms use the SMEDP, it is used more extensively than other government schemes.

Figure 20: Number of firms aware of, and using incentive schemes



The SMEDP scheme is followed by the venture capital and export market and investment incentive schemes with regards to awareness. Most disappointing and of great concern is that firms hardly tap on these schemes in spite of awareness. The non-usage of trade promotion programmes can be partly attributed to the associated administration which is too onerous for smaller firms and the bureaucracy at state institutions (DTI, IDC, etc.).

5. Developments in the Policy Framework

5.1 Policy framework

One criticism of the chemical sector is that it has lost critical manufacturing capacity and skills, has failed to expand and diversify significantly into higher value products, has missed the opportunity to take a share of the high growth markets in the past decade, including such areas as electronic chemicals, speciality chemicals, speciality surfactants, active pharmaceutical ingredients, food and flavour additives and adhesives.[3]

A range of policy initiatives are being explored and implemented to take advantage of niche markets and remove the obstacles to sustained growth and competitiveness of the industry. The key policy initiatives are:

- The ***Advanced Manufacturing and Logistics Strategy*** **(AMLS)** of the National Council of Innovation (NACI) released in November 2002. The strategy proposes a range of microeconomic reforms to ensure the long-term sustainability and competitiveness of the sector within the global context. At the core of this strategy is the need for market-led and appropriate *technology* solutions which can make a significant contribution to the growth and diversification of the industry. Proposed interventions range from exploitation of South Africa's natural resources which are used as primary feedstock to an establishment of a new technology platform that will enable smaller production facilities to compete against the mega plants.[4]

[3] 'Advanced manufacturing and Logistics Strategy' of the National Council of Innovation (NACI), November 2002
[4] See May (2003) 'South Africa's petrochemicals industry – globalisation, restructuring and government policies'

- **The *Integrated Manufacturing Strategy* (IMS)** of Department of Trade and Industry (DTI) also addresses issues of government action to develop industry capabilities and is primarily focused on improving competitiveness. A range of factors are identified as important for firms' competitiveness, including the prices of inputs, infrastructure price and provision, technology and innovation, skills and effective regulation. The IMS is founded on the key thrusts of knowledge-intensity, beneficiation and 'integrated value-matrices which cut across the development of competitiveness capabilities. Value-matrices express the vertical and horizontal linkages through which firms process material inputs into outputs and which include the range of ancillary services such as logistics which are crucial to the process. Eleven sub-sectors within chemicals have been identified by DTI for a series of customized sector programmes.[5] For each it is envisaged that a sub-sector vision and levers to be employed by government will be developed. The overall action plan is to be guided by a Chemical Industry Council which will include government, business and labour.

- The ***Minerals Beneficiation Bill*** **and** ***Liquid Fuels Charter*** are two measures which relate to the behaviour of firms in the upstream chemicals industry. A key challenge is to link measures to concrete initiative to increase beneficiation in the downstream chemicals sub-sector which is under-developed compared with the upstream basic chemicals sub-sector.

There is evidence of concerted effort to make the chemical sector competitive. The DTI has convened a number of chemical workshops to analyse the problems and opportunities of a sector of the South African economy which is considered to have great potential for the future. From a policy perspective, goals of sectoral strategy need to be clear, as the AMLS attempts. Given the diversity and complexity of this sector, a number of related initiatives are in place or underway. The challenge is to better co-ordinate the various initiatives underway and the activities of different institutions such as the Chieta. Also, the development of the downstream industries may not necessarily have a significant positive impact on employment unless the labour-intensive industries downstream are identified. For example, high-tech performance chemicals can add value and enhance exports but are unlikely to create employment on a major scale. One area that can be improved through the skills development programme is enabling the rapid absorption and application of foreign technologies by increasing the availability of suitable technical and management skills.

[5] See May (2003) 'South Africa's petrochemicals industry – globalisation, restructuring and government

5.2 What's in the pipeline?

- A deteriorating national infrastructure will receive a major boost from governments R100bn public works programme. Improved physical infrastructure will enhance industry's ability to produce and deliver goods to local and competitive worldwide markets. Ekurhuleni's allocation will depend largely on the metro's lobbying capabilities.

- The chemicals sector summit (and other manufacturing summits) is scheduled for later this year. Two key issues to be tackled at this summit are the constraints on the development of downstream activities and import parity pricing, and measures that could address this.

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policies'