Market Sector Review of the South African Zinc Market

Report produced to comply with completion of Phase 1.3 of the Sector Partnership of the South African Zinc Development Initiative.

Rob White, April 2002.

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EXECUTIVE SUMMARY

This report is written to fulfil the requirements of Phase One, Activity 3 of the Sector Partnership Programme of the South African Zinc Initiative. This report describes the Sector Analysis of the key drivers controlling the consumption of zinc in South Africa. The analysis covers four major areas, viz. a macro analysis of the drivers affecting the South African economy as they pertain to zinc consumption, an analysis of the zinc consumption trends for the first user consumption market, an analysis of the end user market together with an analysis of factors affecting future market potential and finally, an assessment of the opportunities identified from this analysis.

Increased zinc metal supply will be made available in South Africa by the development of the Anglo-American Skorpion Mine and an increase in capacity at the Zincor refinery. Current supply of primary zinc in South Africa is slightly over 103 500 tonnes per annum of which 13 500 tonnes per annum is exported.

The South African economy is still emerging from a long period of isolation and is undergoing structural economic changes. The government is committed to a privatisation programme but progress has been slow and as a result direct foreign investment has been low. A more open trade policy has resulted in stress in many businesses where inefficiencies have had to be dealt with to ensure business survival and development. A major focus area of industry has been upon improving overall productivity. This has resulted in high unemployment. The population is young in common with many developing nations but, in addition, AIDS is likely to impact upon the availability of labour and delay economic progress. GDP in dollar terms has been in decline for over two decades. However, fiscal stability has been developed and overall, despite currency devaluations, business confidence is on the rise.

The neighbouring countries provide a mixed picture. Political and economic instability in Zimbabwe continues to be of concern. Economic developments further north in Zambia and the Democratic Republic of the Congo appear fragile. However, the prospects for peace in Angola and developments in Mozambique provide economic opportunities.

Taking secondary zinc supply and exports of semis into account, some 98 250 tonnes per year of zinc are absorbed by the first user market with an estimated 61 000 tonnes per year being for local consumption/conversion (2000 figures). This figure compares to an estimated 65 000 tonnes for the year 1995. Therefore, final local consumer demand has fallen by over 6% since 1995. The major areas of decline have been in the alloys (zinc and brass) market. Overall, galvanizing accounts for almost ¾ of all zinc use. This compares to a world norm of 50%. A significant, and rising, amount of alloy scrap is exported and this has resulted in lower availability of material for the alloys industry. A well-developed secondary zinc industry exists and local supply uses this to the tune of 18 500 tonnes per year (although this figure includes imports).

Galvanizing has shown a growth of 6 000 tonnes per year over period 1995 to 2000. This has been in general and continuous galvanizing with the latter being largely for export. However, the increase in general galvanizing has been at the expense of painting as a form of corrosion protection and has been attained during difficult

economic conditions. The industry covers the whole country with adequate capacity. Tube and wire galvanizing offers opportunities via specific projects, which are already being driven in conjunction with the relevant Associations.

The battery market in South Africa is supplied by either imports or the sole local supplier who is only able to supply zinc chloride batteries. However, few clear opportunities are identified in this sector.

The chemicals sector in South Africa, like other countries, is dependant upon supply of secondary oxide. The rubber industry is experiencing growth due to an increase in exports of motor vehicles. Current consumption is estimated at 4 000 tonnes per year of zinc. Overall, some 50% of production is exported and opportunities exist in assisting this and developing global supply where this is feasible. In the area of chemical fertilizers a diverse industry exists and good opportunities exist to raise the 6 000 tonnes per year zinc consumption. Improved agricultural economic returns combined with a possibility of raising the zinc addition level provide opportunities for growth.

The low availability of scrap, old equipment, low re-investment and loss of skills have resulted in large declines in the zinc and brass alloy businesses. Exports of semis have remained buoyant in the brass industry as these manufacturers fight to retain margins. Numerous interventions have been identified from lobbying government for changes in statute to improve competitiveness to Joint Action Groups to focus on specific issues. However, in all instances, companies performing well either produce product for in-house use or have good partnerships with end users. Opportunities within the alloy sector require partnerships with other industry groups.

Looking at the end user market sectors shows that economic fundamentals are improving. A higher government capital-spending programme will provide opportunities in the public infrastructure and construction sectors. The latter has had a particularly bad time over the past few years. Growth in traditional world-class industries, such as mining, has shown substantial increase in activity over the past two years. Interest rate and inflation climates impact greatly upon all sectors but especially the construction and consumer durables sectors. Despite the interest rate rises occurring since the beginning of the year, overall consumer and business confidence is on the rise. This augurs well for all the zinc first user sectors.

Some additional 15 000 tonnes per year of zinc consumption is attainable from identified projects, etc. Possible actions to deliver this tonnage are described together with the partners required to effect this. This tonnage does not include existing markets where promotion activities could easily bring an additional 5 000 tonnes per year. This represents 50% of the target tonnage for the Initiative. Realistically, this could be doubled through the additional production of semis at targeted export markets.

1. BACKGROUND AND OBJECTIVES OF THE STUDY

With the development of future local capacity building in zinc supply via Skorpion and Gamsberg (currently on hold) to a total supply in excess of 550 000 tonnes per annum, local market development initiatives should be considered. This will enable greater leverage of export earnings through the export of value added products and provide for growth of existing and development of new businesses. Currently, some 96 000 tonnes per year of primary zinc is consumed in South Africa.

Discussions have been held with the International Zinc Association, of whom Anglo American and Kumba Resources are members, to see what appropriate initiatives can be explored. This is particularly important when one considers the market consumption trends experienced in South Africa when compared to those globally. This is shown in **Figure 1**.

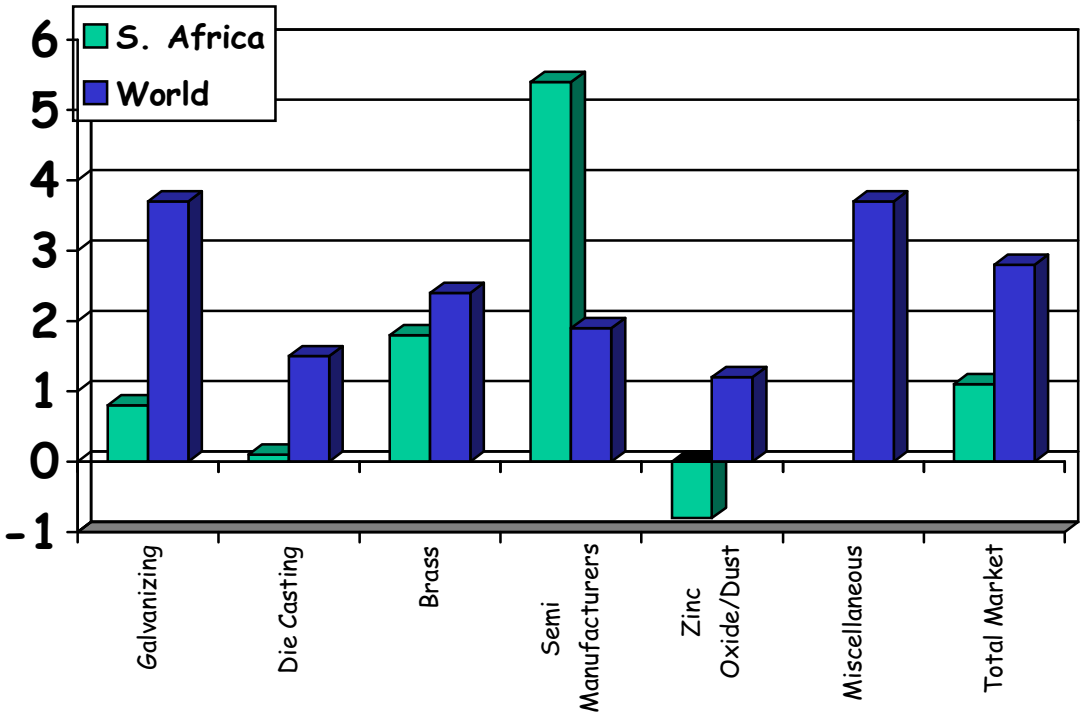


Figure 1. Consumption trends for zinc 1978-1998 (source IZA, ILZSG).

In order to maximize the benefits for local industry a forum was held in July 2001 with local industry players, the President of IZA and the local representative of the International Lead Zinc Research Organization in attendance. From this a project objective was developed to-

1. Identify and quantify the potential for market growth in each segment of the zinc industry in Southern Africa.

2. Increase the intensity of zinc use in Southern Africa.

It is proposed that a local organisation be set up as the International Zinc Association (Southern Africa) (IZASA), to facilitate and drive the above project. The objectives of IZA (SA) will be - to increase the intensity of use of zinc in South Africa (local and export). Two start programmes were identified for action -

1. Awareness – create a general understanding of the meaning of zinc in modern day life (schools programmes, general advertising, targeted PR campaigns). Obtain key success factors employed in new IZA operations.
2. Projects - do a needs analysis to develop business plan –
    a) Develop defined objectives and role of IZA (i.e. where participant and where facilitator. IZA should be the focus for marketing and capacity building programmes).
    b) Look for structure and coherence by investigating the key drivers and local opportunities in the following sectors:
        i) Die-casting.
        ii) Wire (look at Export Council).
        iii) Brass products.
        iv) Chemicals (oxides, pharmaceuticals, coatings).
        v) Battery industry.
        vi) Continuous galvanizing –key projects.
        vii) General Galvanizing (Hot Dip Galvanizers SA). In this sector alone a number of market development projects have been identified using IZA benchmark information as the basis for identification. These could result in a 25% increase in local consumption of zinc.
        viii) Tube products (Association of Steel Tube and Pipe Manufacturers).
        ix) Semis (zinc wire, sheet, etc).

    c) From the above identify major players, agendas and synergies (e.g. batteries, die-castors, etc into the MIDP) to derive information on local market opportunities and identify gaps in performance when compared to overseas. Also look for competitive impediments to growth.
    d) Compare with IZA successes in overseas with comparable markets. Look for similarities to effect maximum opportunities.
    e) Construct ranking system to enable b), c) and d) to operate simultaneously rather than sequentially.
    f) Target 3 to 4 projects, which will add meaningful tonnage consumption in South Africa.

2. MACRO DRIVERS IN THE SOUTH AFRICAN ECONOMY

2.1 Respondents

Although the model described below was devised to be consistent with the standards applied to previous sector cluster studies, analysis where possible was enhanced through discussion with senior personnel in the following areas:

Export Council Managers
MIDP participants (government, Naacam)
Industrial Participation Management (Arms offsets)
Company economists
Stats SA
SARS (trade information)
DBSA
Minerals Bureau

2.2 Overview

Models abound regarding the macro-economic factors that encourage improvements in country performance. However, they all have the same basis - competitive advantage and sustained growth all require government intervention in addition to industry performance. Recent publications by the OECD indicate that productivity is the key to long-term sustainable development within a nation.

Much of the industry research carried out in South Africa has been funded by the World Bank using Porter's models of productivity – *the value of output produced per unit of labour or capital.* Cluster analyses have been drafted looking at the "Diamond" model. For clarity and comparison therefore, a similar analysis will be used in this study.

The primary objective of this study is the identification of opportunity gaps in zinc utility in South Africa. This can either be the result of current under-utilisation of capacity or the poor development of new markets locally. For this analysis some macro indicators are required.

It is important to have data on the current performance of South Africa, apparent opportunities for growth in South Africa and structural comparisons with other developing countries (with the inclusion of some developed nations as a benchmark).

2.3 Trends in South African economy

South Africa emerged from an isolated position after the first fully democratic (all races eligible to vote) elections of 1994. Prior to this time, the economy had been run on a self-sufficiency basis with focus upon import substitution and strategic industrial development to ensure survival in the event of full world isolation. Investment was funded primarily from government from revenues generated from the rich minerals industry of South Africa.

The country has a highly developed infrastructure and an efficient agricultural sector.

South Africa has a population of 42 million. However, income distribution is wide with GDP per capita being $3170 (source World Bank). Unemployment rates are high as shown in **Figure 2**.

Figure 2. Unemployment rates per province (1996) **(Source Stats SA).**

Formal sector employment decline has mirrored the poor rate of increase in GDP. Since the mid-1990s there has been a move away from the association of economic growth and employment as the jobless growth phenomenon has taken place. This is shown in **Figure 3**.

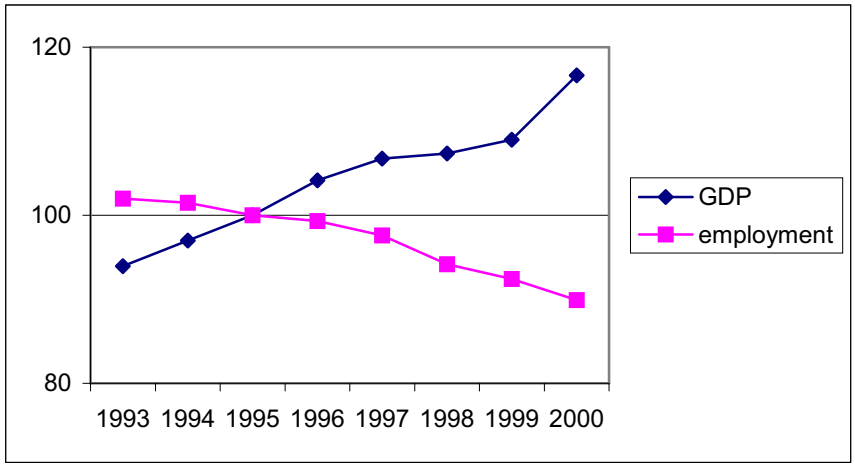


Figure 3. Disparity between growth in GDP at 1995 prices and employment **(Source Stats SA, SARB).**

Some registered employment changes over the past 30 years are:

Mining	-1.6%
Manufacturing	0.8%
Construction	0.0%
Retail/Tourism	-1.4%
Local Authorities	0.9%

Since 1970, population growth has been significant and, as a result, the overall population is becoming younger (see **Figure 4**). Whilst this trend is typical of developing countries, the birth rate is falling as urbanisation gathers momentum. However, the wild card in the population equation is the impact that AIDS will have upon the young sector of the population. Although various population statistics are available, a more important effect will be upon the social needs arising and the loss of skills. The United Nations anticipates that the financial impact of the disease will be great, removing 0.3 to 0.4% of the growth rate per year for the foreseeable future. This will make South Africa's GDP in 2010 17% lower than would otherwise be possible (equivalent to a possible $22 bn).

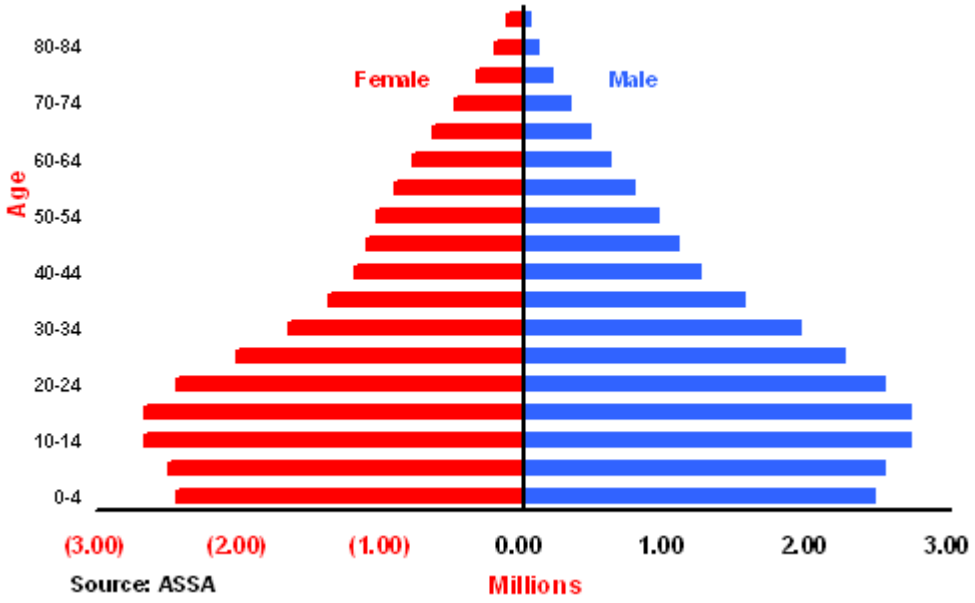


Figure 4. South Africa – population prediction for 2010 (taking account of AIDS) (source UN).

Since 1994, the ANC (African National Congress) government has developed a policy based upon tight fiscal management and has opened the economy through trade liberalisation. A privatisation programme (albeit slow) is in place and government is committed to its programme known as GEAR (Growth, Employment & Redistribution (of wealth)). The actual formula adopted relies on medium growth acceleration based on rising exports accompanied by increased investment. The immediate triggers of growth are a lower real exchange rate and a lower rate of inflation, which depend in turn on tight monetary and fiscal policies and wage restraint. Private investment (both domestic and foreign) is seen as essential for economic growth.

In November, 1999, President Mbeki put privatisation on the fast track by announcing an aggressive program to accelerate privatisation of the "big four" parastatals - Eskom (power generation and distribution), Denel (defence), Transnet (transportation), and the rest of Telkom (telecommunications) - valued at over US$ 25 billion, and representing 90 percent of SA Government assets. The Department of Public Enterprises was tasked with prioritising the top 300 (of over 800) State Owned Enterprises (SOE's), creating a publicly accessible SOE database, setting a privatisation timetable, and most importantly, building capacity within the Department. As of June 2000, the Department had lagged in privatisation. Indeed for the 2001-02 financial year the Telkom IPO was budgeted to provide R18bn. Clearly, the international environment was not conducive to this process. Fortunately, improved revenue collection increased government revenue by R15bn anyway. However, the lack of Foreign Direct Investment is still considered to be an impediment in Africa as a whole. Per capita investment is less than $225 in Africa compared to over $3200 in the USA. Notwithstanding this, significant government assets are to be sold within the next four years.

Two critical problems exist in South Africa. The employment creation targets have not been remotely met: it was forecast that between 1996-2000, some 340,000 jobs in all sectors would be created annually. In fact the economy has continued to shed jobs (see **Figure 3**). Private investment, both domestic and foreign, and especially foreign direct investment, has not materialised to date. Indeed, investment (by industry and government) only last year showed an improvement after many years of decline. This is highlighted in **Figure 5**.

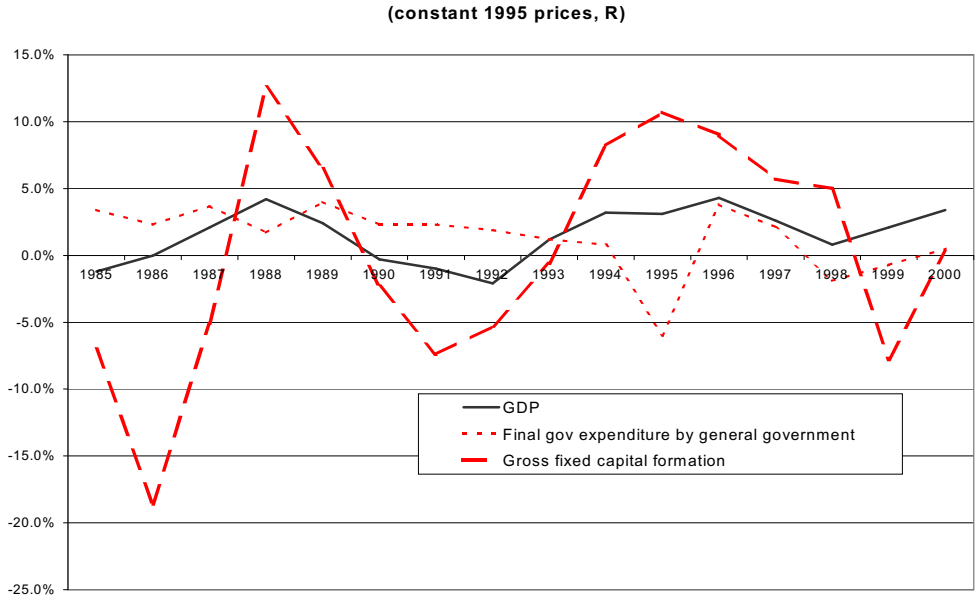


Figure 5. Percentage change in investment & GDP since 1995 **(Source SA Reserve Bank).**

Various initiatives are in place to improve productivity in South Africa and provide opportunities for SMME's (small, medium & micro enterprises). However, foreign direct investment is still limited to certain key areas such as the small but growing auto-manufacturing industry. Growth has been encouraged through the Motor Industry Development Programme (MIDP) through which a value credit system is

employed allowing the duty free importation of certain key components against credits obtained by the export of others. This system has resulted in certain key industries developing to world-class efficiency levels (e.g. The catalytic converter industry).

Another initiative is through the Industrial Participation Programme, whereby, suppliers into the Arms programme (a large purchase in excess of R35bn) have committed themselves to providing assistance in three ways –

1. Opening of export markets to local companies
2. Debt financing or equity participation in approved enterprises
3. Facilitation of partners for joint ventures and the like.

In line with this macro-economic policy, exchange control has been substantially lifted, real interest rates have been reduced significantly (after some hikes due to external pressure), and the budget deficit has come down from 10% in 1993/1994 to an estimated 2,6% for 2000/2001. Inflation has fallen from an average of 12,5% between 1990 and 1994 to 5,25% in 1999. These factors impact immensely upon consumer confidence which should, in time, result in increased consumer expenditure on all durable goods including house purchases.

Part of this restructuring has resulted in tighter government expenditure. Capital expenditure in the Public Sector increased from R30.93bn in 1998 to R34.75bn in 1999. However, 82.5% of this was spent by Public Corporations that showed a rise in expenditure from R19.12bn to R23.09bn from 1998 to 1999. Capital expenditure on new construction works and machinery are shown in **Table 1**.

Table 1. Capital expenditure by government and its agencies (Source Stats SA).

Capex Item	1999	2000	2001	2002
New construction*	R16.13bn	R16.85bn	R15.42bn	R11.43bn
Machinery & equipment	R18.3bn	R16.75bn	R11.54bn	R16.85bn

* >50% into building construction, 33% into roads and related construction, 8% into water projects.

It is clear that capital spending by government (central, provincial and local) has been static. Overall, as a percentage of GDP, government spending (consumption expenditure plus gross capital formation) has declined from 27.4% of GDP in 1986 to 18% by the end of 2001. However, the hardest hit expenditure has been gross capital formation by government bodies. This process reflects the government's determination to strengthen the balance sheets of its various institutions and corporations. However, naturally, there has been a reduction in the importance of government as a customer for capital goods. To some extent, the capital expenditure issue was addressed in the latest budget where capital expenditure will grow by 15% per year over the next three years. According to the Budget Review, infrastructure-related public expenditure totalled R48.8bn in 2001-02 (about 4.9% of GDP) and will increase to R56.7bn (5.2% of GDP) in 2002-03. National expenditure will rise to R288bn from R263bn (9.6%) for the coming year. The recent improvement in capital spending is shown in **Figure 6**.

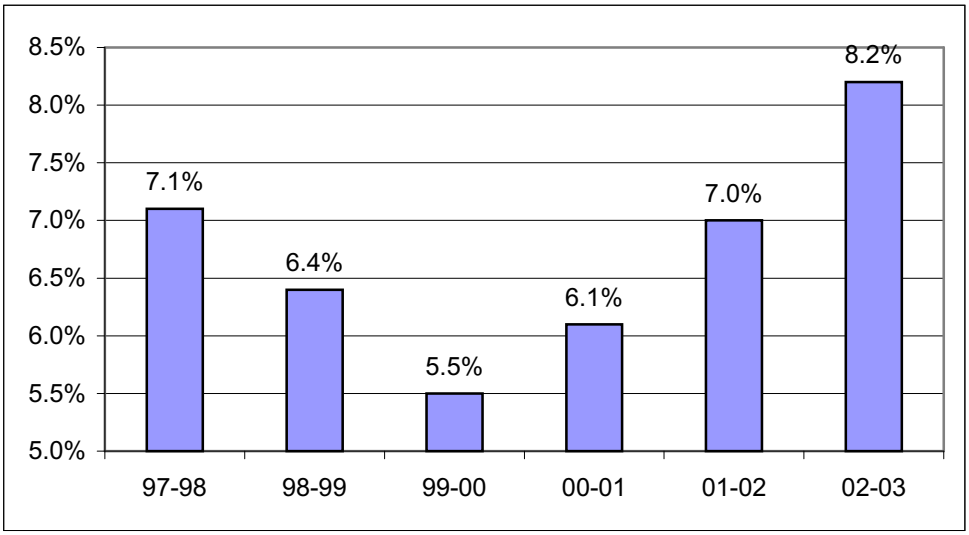


Figure 6. Capital expenditure as a percentage of budget **(Source Budget Review).**

A significant amount of expenditure is financed through the Development Bank of Southern Africa (DBSA). As at the end of March 2001, the bank had a loan book of over R23bn. The DBSA's activities are broadly via three mechanisms – the first being the SA Business Group, the second the Private Sector Investment Group, the third being the Regional Business Units. The focus of the SA Business Unit is in investments in the SADC countries (excluding South Africa). Some R4.9bn has been passed as approved investment through 12 projects ranging from electrification transmission towers to telecommunication systems to irrigation programmes. The Private Sector Investment Unit offers partner financing to projects as diverse as the Mozal 2 project and the Kruger Park Gateway Airport. The Regional Investment Units invest within South Africa with a key focus on capacity building (infrastructure and skills). Many of these projects should have provided opportunity for the galvanizing industry.

The GDP per capita of South Africa, in US dollar terms, has essentially been static for an extended period. This explains the low rate of job creation and has recently become source of frustration for government, which, despite pursuing an active monetarist policy has failed to improve foreign direct investment to the levels required to generate true growth. **Table 2** shows the historic trends.

Table 2. Some key indicators of the performance of the South African economy **(Source World Bank).**

	1980	1990	1999	2000	2001	
GDP (US $bn)	80.5	112.0	130.2	125.9		
Agriculture	62.0%	46.0%	34.0%	32.0%		
Industry	48.2%	40.1%	30.8%	30.9%		
Manufacturing	21.6%	23.6%	18.8%	18.8%		
Services	45.6%	55.3%	65.8%	65.9%		
exports (US $bn)	28.3	23.5	28.6	35.8		
gold	13.0	6.0	4.0	4.4		
food, bev, tobacco	2.7	1.7	2.5	3.1		
manufactures	3.5	6.1	10.0	12.5		
imports (US $bn)	21.8	17.3	24.5	30.9		
food	0.9	0.9	1.6	2.0		
fuel & energy	7.6	6.4	2.9	3.6		
capital goods			11.8	15.0		
			Average annual growth, %			forecast
	1980-90	**1990-00**	**1999**	**2000**	**2001**	**2000-04**
GDP	1.0%	2.0%	1.9%	3.1%		3.3%
GDP/capita	-1.5%	0.0%	0.2%	1.4%		2.1%
Agriculture	2.9%	0.6%	3.4%	2.5%		
Industry	0.7%	1.0%	-0.4%	2.3%		
Manufacturing	1.1%	1.2%	-0.2%	3.6%		
Services	2.4%	2.6%	3.3%	3.6%		
exports	1.9%	5.3%	1.3%	8.2%		5.0%
imports	-0.6%	7.3%	-7.4%	8.0%		
Private consumption	2.4%	2.6%	1.1%	3.2%		
General government consumption	3.5%	0.5%	-1.9%	3.0%		
General government consumption (excl salaries)						
Gross Domestic Investment	-5.3%	2.7%	-3.5%	6.5%		

The South African economy has undergone some structural changes over a period of time and these are reflected in the changes of the economic sector components to GDP. This is highlighted in **Table 3**.

Table 3. Percentage contribution to economy per sector **(Source SARB).**

	1975	1980	1985	1990	1995	1998
Agriculture, forestry & fishing	5.40%	5.70%	5.40%	6.10%	5.30%	6.40%
Total mining	13.90%	13.30%	13.00%	11.30%	10.50%	9.90%
Total manufacturing	30.10%	32.80%	29.40%	29.60%	29.30%	28.30%
Electricity, gas & water	3.10%	3.60%	4.60%	5.10%	5.60%	5.90%
Building & construction	6.30%	5.00%	4.40%	4.00%	3.40%	3.30%
Services	41.10%	39.60%	43.20%	43.90%	45.90%	46.30%

The decline in the primary sector, as reflected in the lower percentage contributions from the mining and agricultural sectors and the relative growth in manufacturing and the services sector, is consistent with the country's economic development. However,

the importance of mining (see discussion below) and agriculture, in terms of exports, should not be underestimated (see **Table 4**).

Table 4. Percentage contribution per economic sector to exports **(Source SARB).**

	1970-80	1980-90	1990-00
Agriculture & forestry	6.9%	3.5%	4.2%
Mining	54.0%	61.3%	40.9%
Manufacturing	24.6%	23.6%	40.3%
Electricity, gas & water	0.1%	0.1%	0.1%
Construction	0.0%	0.0%	0.0%
Services	14.4%	11.5%	14.0%

To identify whether capacity constraints exist, utilisation figures for various key industries are shown in **Table 5**. From this it is clear that the majority of industries are running below optimum utilisation. As would be expected from the GDP data, the main reason for this is low demand followed by a shortage of input materials. However, an extended period of inventory de-stocking has occurred (see **Figure 7**). Combined with the recent increase of investment through capital expenditure and improved productivity (see **Figure 8**), all the indicators point to a manufacturing base, in particular, that is well positioned to increase production with little added cost. Clearly, anything that may encourage this increased demand should point to a robust increase in economic activity.

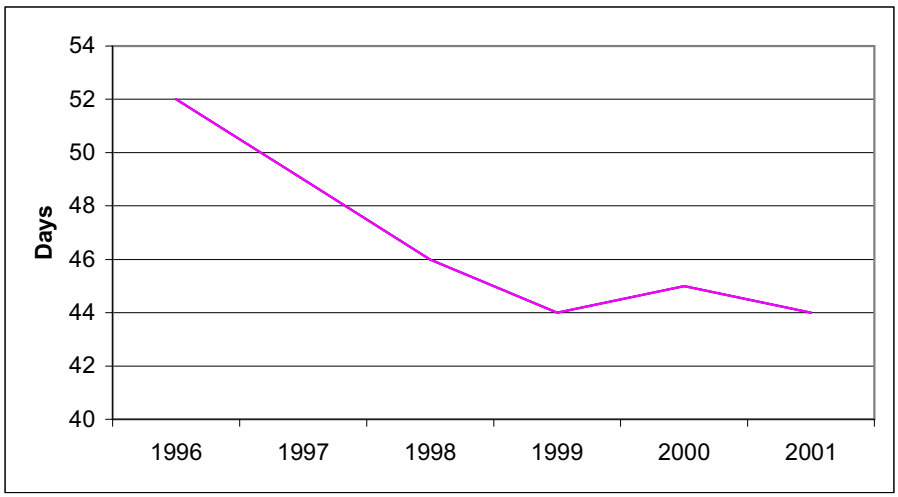


Figure 7. Ratio of industrial and commercial inventories to sales **(Source SARB).**

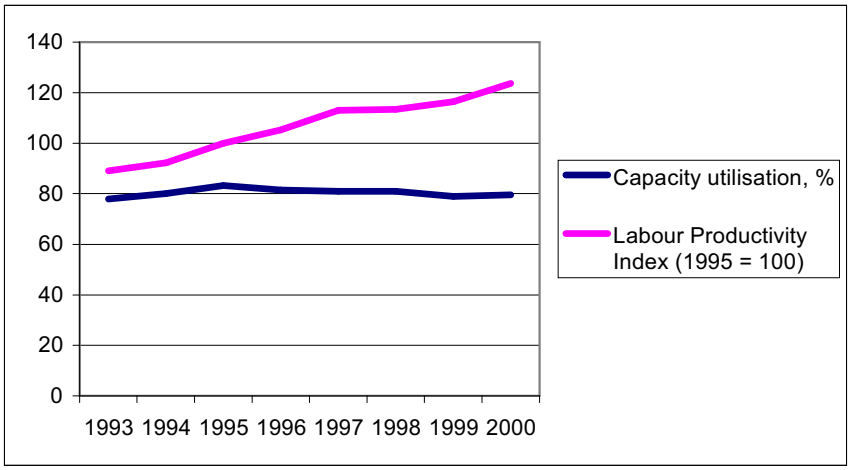


Figure 8. Plant utilisation and labour productivity (Source SARB).

Table 5. Capacity utilisation of selected economic sectors (Source Stats SA).

	Utilisation	Total under-utilisation	Reasons for under-utilisation				
			Shortage of				
			Raw materials	Skilled labour	Semi & un Skilled labour	Insufficient Demand	Other
	Basic Chemicals						
1999	82.9%	17.1%	2.6%	0.1%	0.0%	12.0%	2.4%
2000	80.7%	19.3%	4.3%	0.3%	0.2%	11.1%	3.4%
2001	82.2%	17.8%	4.0%	1.7%	0.1%	6.9%	5.1%
	Other Chemicals						
1999	75.7%	24.3%	2.5%	0.3%	0.1%	18.2%	3.2%
2000	76.2%	23.8%	2.0%	0.1%	0.1%	18.2%	3.4%
2001	78.1%	21.9%	2.0%	0.2%	0.0%	17.1%	2.6%
	Rubber						
1999	76.3%	23.7%	1.2%	0.0%	0.0%	17.2%	5.3%
2000	77.1%	22.9%	1.5%	0.0%	0.0%	15.6%	5.8%
2001	74.0%	26.0%	1.7%	0.0%	0.0%	11.3%	13.0%
	Total machinery & Equipment						
1999	74.9%	25.1%	0.9%	0.5%	0.1%	21.5%	2.1%
2000	76.1%	23.9%	1.6%	0.6%	0.0%	19.5%	2.2%
2001	77.8%	22.2%	1.9%	1.5%	0.2%	17.0%	1.6%
	Motor vehicles, etc						
1999	68.7%	31.3%	2.7%	0.1%	0.0%	23.8%	4.7%
2000	74.6%	25.4%	1.9%	0.4%	0.0%	19.1%	4.0%
2001	75.1%	24.9%	1.4%	1.2%	0.3%	18.6%	3.4%
	Fabricated metal products						
1999	76.1%	23.9%	0.6%	0.2%	0.0%	21.8%	1.3%
2000	77.4%	22.6%	0.8%	0.2%	0.0%	20.4%	1.2%
2001	80.5%	19.5%	1.6%	0.6%	0.2%	16.1%	1.0%

The vibrancy of an economy is generally reflected in the performance of its key industries. These will be identified and examined per sector identified as key drivers for zinc demand.

In order to analyse each important sector, estimates of future indices are shown in **Table 6**.

Table 6. Five year macro-economic forecast (Source FNB, 2002, databuild, 2002).

Real GDP	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
GDP	4.2	2.5	0.5	1.2	3.3	2.2	2.3	3	3.5	3.5
Private consumption	5	2.7	1.3	0.7	3.2	2.8	2.5	2.7	3.6	3.7
Government consumption	6.4	3.3	0.5	-1.9	0.5	1.3	2.1	2	2	2
Gross Fixed investment	7.5	5.2	4.8	-6.9	0.3	3.1	3	3.3	6	8
Exports	9.3	5.5	2.3	0	8.3	1	-5	6	8	7
Imports	8.7	5.4	2.1	-7.1	7.4	-1.5	-6	5	10	12
Change in stocks	0.6	-0.2	-0.9	0.6	0.7	0.3	0	0.2	1	-0.5
Domestic demand	4	2.4	0.5	0.5	3	1.6	2.1	2.7	3.8	4
Exchange rate R/$ (av)	4.3	4.6	5.5	6.1	6.9	8.7	12	13	14	15
Exchange rate R/$ (yr end)	4.7	4.9	5.9	6.2	7.6	12.1	13	14	15	16
Headline CPI Inflation (av)	7.3	8.6	6.9	6.9	5.2	5.7	6.9	6.6	5.3	4.8
CPIX inflation (av)						6.5	8.1	6.5	5.8	5
Prime Rate, % (av)	19.5	20	21.8	18	14.5	13.7	14.5	13.5	13	12

It should be noted that the recent (March 2002) economic shocks in the CPIX and the SARB response to these is likely to cap growth markedly. The CPIX is trending to 10% and the prime-lending rate is now likely to reach 16% soon and only ease back to 15% by the end of 2003.

Business confidence indices provide a base for perceptions of the active players in industry. The RMB/BER index is included for completion only (**Figure 9**). This index surveys the building contractor, manufacturer, wholesaler, retailer and new vehicle dealer business confidence. The top four concerns remained domestic demand, crime, exchange rate fluctuations and the political climate within the country. However, the index has climber back to the levels of the beginning of 2000, which indicates that the events of last year should be behind us.

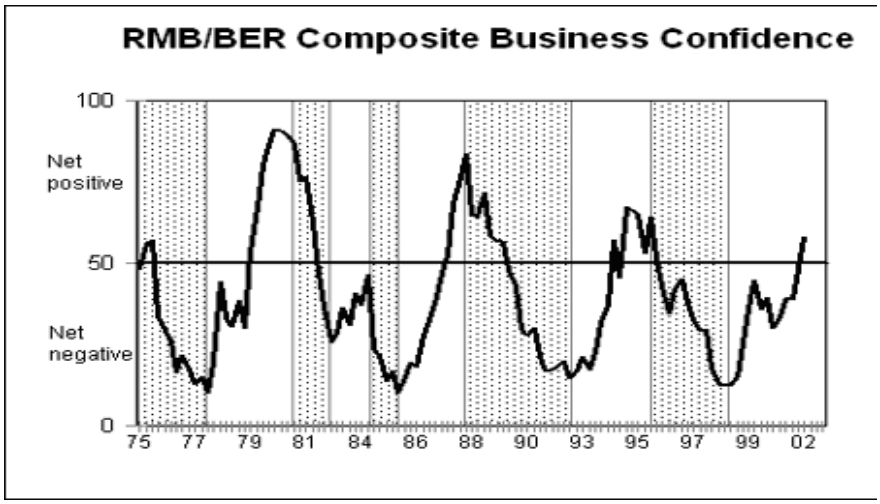


Figure 9. RMB/BER Composite Business Confidence Index (Source RMB/BER).

This is reinforced by the FNB/BER Consumer Confidence Index which climbed 7 points in March 2002 and now stands only 5% short of neutral (**Figure 10**). Although surprising, the rise in the Index is thought to be due to the strengthening Rand

exchange rate and appears to indicate a willingness by the consumer to spend. A Business confidence index should reflect the real economy. To test this, information is taken from the SARB Quarterly Report (December 2001) (**Figure 11**).

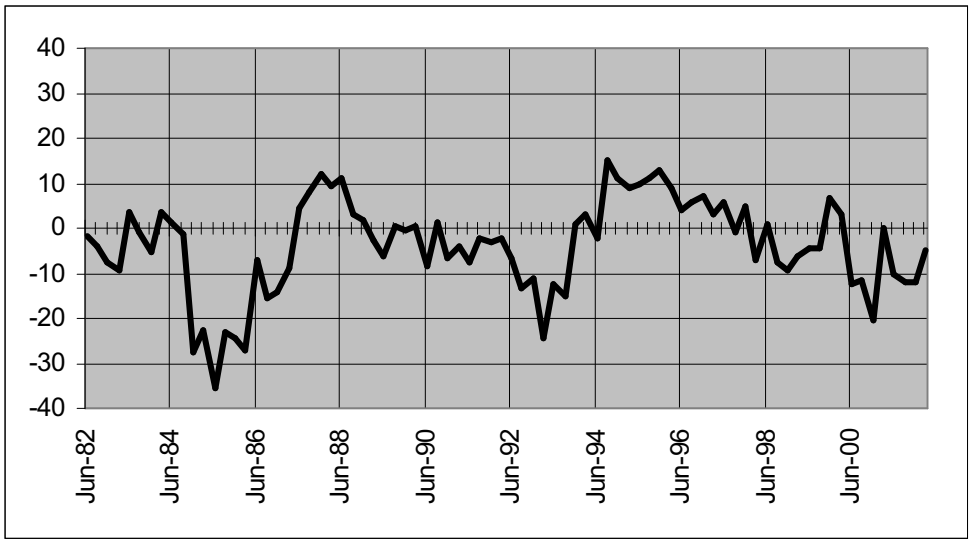


Figure 10. FNB/BER Consumer Confidence Index (Source FNB).

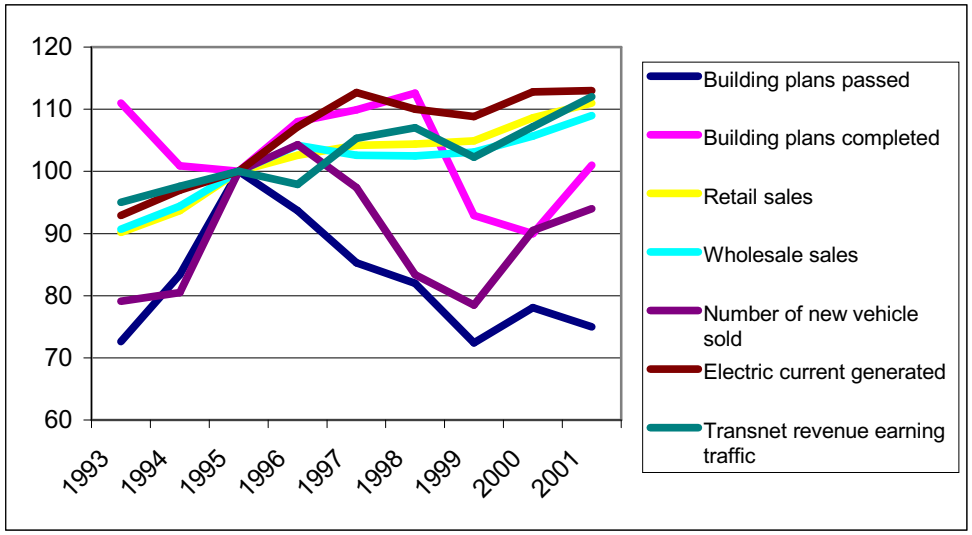


Figure 11. Some indicators of real economic activity (seasonally adjusted indices: 1995 = 100) (Source SARB).

It is clear from **Figure 11** that there has been an improvement in economic activity over the past couple of years. The recently announced tax cuts could well counter some of the adverse affects of the decline in the international value of the Rand. This in turn indicates that 2002 may not be as soft as some predict.

Finally, the health of the private sector can be gauged from the performance of the sector when compared against the overall performance of the private sector. To gauge this, the share performance of a number of selected sectors is shown in **Figure 12**. From this the recent rally in the construction, mining and chemicals sector is clearly visible. The telecommunications, transport and retail indices indicate the current fragile nature of the economy. However, the turn in the retail sector is just noticeable.

However, as mentioned before, clearly the robustness of this recovery will be interest and inflation rate dependant.

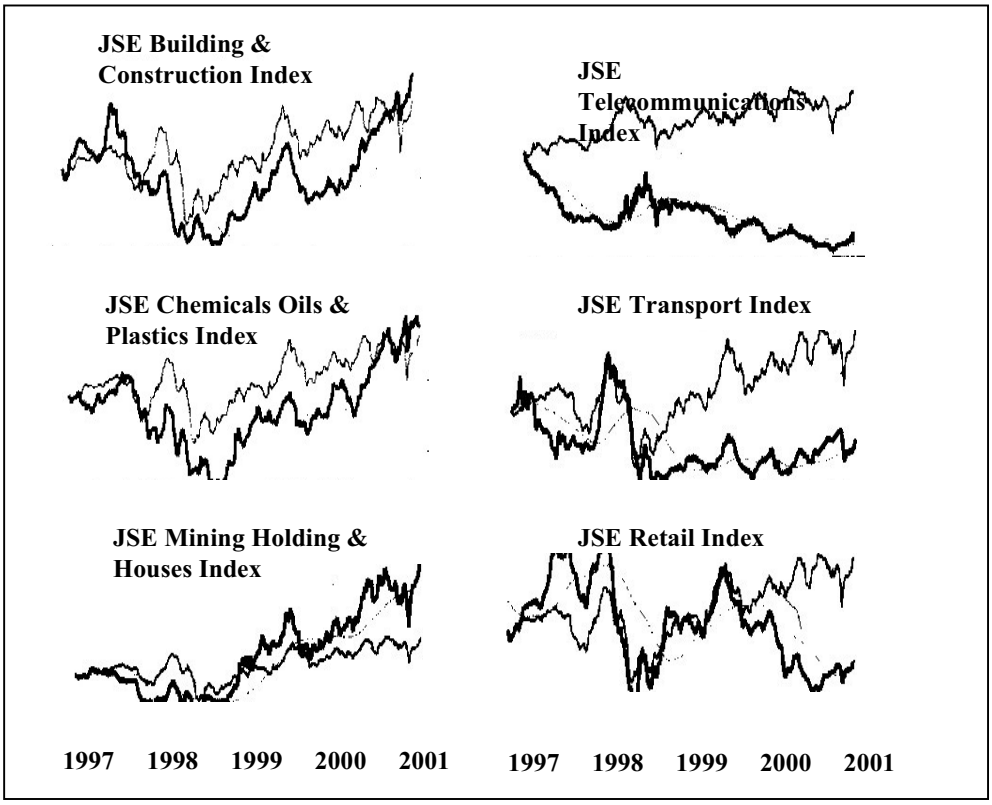


Figure 12. Performance of various JSE Indices (bold) versus the overall Index (Source JSE).

3. SADC COUNTRIES

The economies of the 14 countries in the Southern Africa Development Community (SADC) are expected to grow by an average of 3.5% in 2002. However, the projected differences in growth rates (+10.3% in Angola to –5% in Zimbabwe) highlight the difficulties and opportunities for market goods. This information is primarily provided to allow assessment of possible sector growth that could impact upon regional zinc demand.

It is clear that economic activity is focused on primary activities (mining and agriculture). This represents the largest single area of foreign direct investment. During the last 5 years of the previous decade, total Foreign Direct Investment flows grew to about $ 1.2 trillion globally by the year 2000, with about $ 1 trillion (84%) going towards developed countries. The developing world got only 16%, but this figure is also severely skewed. Of the total FDI flows to developing countries, Latin America got about 32%, Emerging Asia got 55% and Emerging Europe got just over 10%. This leaves only 3% ($ 8 billion) of developing countries' FDI flows for the entire African continent. On a global scale, Africa gets a meagre 0.6% of FDI flows. If countries like South Africa (the biggest recipient of investment in Africa) and Nigeria are also excluded from this, it is easy to see why Africa is the poorest continent on earth.

Political instability is hindering development and together with poor infrastructure, development opportunities lie primarily in public infrastructure when funding for this becomes available. In this regard, Mozambique and Swaziland appear to offer opportunities. Agricultural needs (fertilizers, etc.) are paramount in the SADC countries. However, only Tanzania, Namibia and Zambia (if distribution problem are overcome) offer real opportunities. All the high growth countries offer opportunities in the corrosion protection area. Some basic data on the SADC countries is shown in **Table 7**.

Table 7. Growth prospects in the SADC countries (Source Business Day, World Bank).

Country	GDP 2000	Pop.	GDP 2002 f'cast, %	Comments
Angola	$8.8bn	12.7m	10.3%	Increased oil output
Mozambique	$3.8bn	17.6m	9%	Growth resulting from increased foreign investment (Mozal Al refinery, Temane Gas pipeline)
Mauritius	$4.3bn	1.2m	6.4%	Increased revenues from textiles & sugar. Growth rates have been >5% since 1990
Tanzania	$9bn	33.7m	5.2%	Agricultural & mining growth
Zimbabwe	$7.2bn	12.6m	-5%	Fiscal mismanagement, lower investment & business confidence

Seychelles	$0.6bn	0.1m	zero	Fiscal mismanagement & poor tourism outlook
South Africa	$125.9bn	42.8m	2.1%	Subdued local & foreign demand
Dem. Repub. Congo	$4.5bn	51.4m	2.5%	GDP has halved since 1990. New IMF funding & political stability provides opportunities for growth
Botswana	$5.3bn	1.6m	4.1%	Has had a high growth rate for 10 years (+7%pa). Growth slowing due to lower diamond demand
Lesotho	$0.9bn	2.2m	2.8%	Textile export growth (using US AGOA act)
Swaziland	$1.3bn	1m	2.3%	New construction projects & use of US AGOA act. Sugar, wood, cotton & pulp are major exports.
Zambia	$2.9bn	10.1m	3.0%	Suspect forecast optimistic in view of reduced mining activity & structural problems in the poorly performing agricultural sector
Namibia	$3.5bn	1.7m	3.5%	Reduced diamond demand but increased foreign direct investment (e.g. Malaysian textile plant)
Kenya	$10.4bn	30.1m	4.4%	Agricultural sector still strong and manufacturing base expanding

4. TRADE STATISTICS

4.1 Primary and recycled zinc

Imports and exports were determined from the SARS figures and modified after discussions with the primary zinc supplier and the various recyclers. The information provided is given in **Tables 8 and 9**. The zinc scrap figures are considered unreliable.

Table 8. Imports of primary and recycled zinc (2000) *(1995)*.

Description	**Tonnes**	**Zn equiv tonnes**	*Tonnes*	*Zn equiv tonnes*
Ash, residues	10807	6500	*1539*	*1000*
Zinc scrap	750	750	*567*	*567*
Zinc Oxide	211	169	*179*	*179*
Zinc (ingot, etc)	4500	4500	*7500*	*7500*
Totals		**11300**		***9250***

Table 9. Exports of primary zinc and related products (2000) *(1995)*

Description	**Tonnes**	**Zn equiv t**	*Tonnes*	*Zn equiv tonnes*
Ash, residues	660	396	*0*	*0*
Zinc scrap	2864	2864	*311*	*311*
Zinc Oxide	759	607	*761*	*610*
Zinc Dust	738	738	*415*	*415*
Zinc (ingot, etc)	13618	13618	*7657*	*7657*
Totals		**18250**		***9000***

4.2 Semis

It is difficult to determine exact figures for the trade in finished goods (final user market). However, the trade in semis (rod, bar, extrusions, etc.) can be obtained as the tariff descriptors are sufficiently detailed. Import and export data is shown in **Tables 10 and 11**.

Table 10. Imports of zinc containing products (2000) *(1995)* **(Source SARS).**

Description	**Tonnes**	**Zn equiv tonnes**	*Tonnes*	*Zn equiv tonnes*
Zinc articles	268	268	*137*	*137*
Chemicals	1780	890	*2311*	*1387*
Copper/brass alloys	998	249	*1118*	*447*
Zinc coated steel	29494	1475	*14634*	*731*
Zinc/Al coated steel	13392	335	*0*	*0*
Totals		**3000**		***2750***

Other than imports of coated steel, there are no identifiable large imports of primary zinc containing products. The high import figure in chemicals is solely due to a high import figure for zinc chloride.

Table 11. Exports of zinc containing products (2000) *(1995)* **(Source SARS).**

Description	**Tonnes**	**Zn equiv tonnes**	*Tonnes*	*Zn equiv tonnes*
Zinc articles[1]	3947	3947	*167*	*167*
Chemicals[2]	7034	4220	*3044*	*1826*
Copper/brass alloys[3]	44532	8906	*14189*	*2837*
Zinc coated steel[4]	290362	14518	*265108*	*13255*
Totals		**32000**		***18000***

1. Zinc articles include all identifiable zinc semis. It, therefore, excludes any brassware or other final products.
2. Chemicals refer to primary chemicals (chlorides, sulphides, sulphates, chromates, octate stabilisers).
3. Excludes scrap.
4. Includes Iscor & DSP products

Clearly, any secondary chemicals such as fertilizers, etc. are excluded from these figures. Exports in all sectors appear to have grown.

4.3 The scrap market

The zinc die-casting and brass industry utilise scrap widely. Export of scrap arisings is seen by many as simply a route of obtaining foreign currency. As a result there is a shortage of scrap for conversion locally. Prior to 1994, a preference export duty system was in place whereby supply to a local manufacturer attracted a rebate of 15% against the potential export price. This clearly favoured local value adding, even if for eventual export. However, the system did permit inefficiencies to persist in the production of products such as brass semis. The trade resulting from the removal of this incentive is clearly shown in **Figure 13**. Assuming that some 10% of the copper trade is actually zinc, then the potential recyclable zinc scrap leaving the country is 10 000 tonnes per year. This directly impacts upon the competitiveness of the brass and die-casting industries.

In terms of the Second Hand Goods Act, zinc is excluded. It is, therefore, not necessary to notify the authorities when scrap zinc is moved. An export business has evolved whereby, at times, incorrectly coded material is exported. This may result in high-grade scrap leaving the country on a lower grade tariff code. Thus, high-grade scrap is leaving the country to the detriment of the local market. To show the impact upon the industry –

Average Domestic Price R/t

	Primary zinc, R/t	Scrap zinc, R/t
1963	R220	R110
2001	R7000	R4500

The Non Ferrous Metal Industries Association (NFMIA) is currently lobbying government to include zinc (together with aluminium and tin) in the Act. If this is a

lever affecting competitiveness, this action by the NFMIA should be supported by this initiative. More detail on the impact of this issue is included in the Brass and Die Casting Industry reports (**Sections 7.4.4 and 7.5.2**).

In order to obtain a picture of the scrap trade, imports & exports are shown in **Figure 13**.

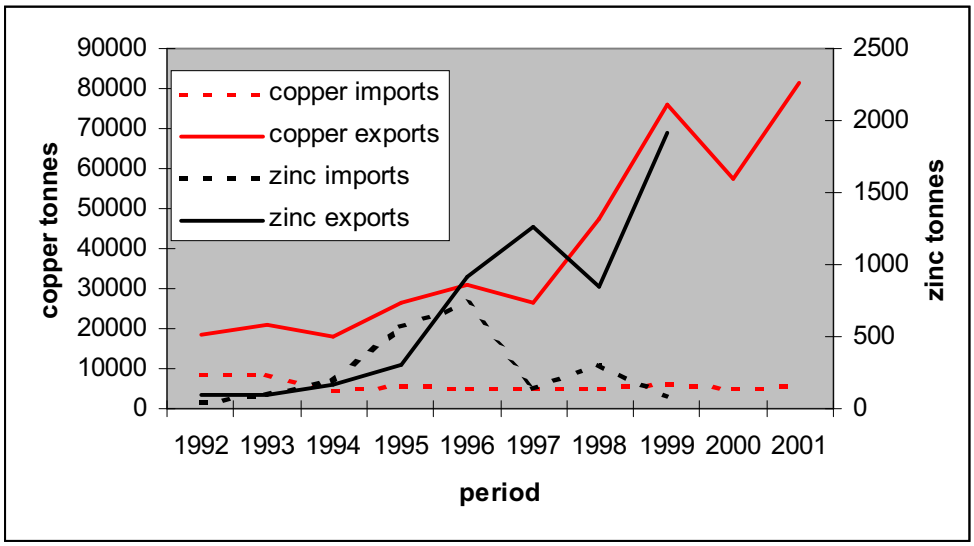


Figure 13. Scrap Trade for copper and zinc alloys (source SARS).

5. THE SOUTH AFRICAN ZINC RECYCLING INDUSTRY

5.1 Introduction

The secondary market (recycling) covers zinc alloys, the brass and chemicals industries. All these industries rely for their international competitiveness upon reliable cheap supply of secondary material. The impact of the scrap trade upon the alloy (brass and zinc) industries has already been discussed. The majority of the arisings for the zinc recycling industry come from the galvanizers (general, wire, tube and continuous). Product return from the general galvanizers is on an open market basis with the recyclers operating a preferential supply system in return for waste zinc residues. The continuous galvanizing industry works on a tender system.

Three methods have been employed to determine the recycling industry volumes:

1. Best guess from information obtain from all sources contacted during this survey.
2. The use of mass balance information from the zinc flow pattern used as the format for the first report on SA zinc statistics.
3. Market consumption figures (viewing local and export) to determine the shortfall recycled to supply actual consumption after allocation of primary zinc supply.

As it is not the intention of this report to divulge specific confidential information derived figures will be shown from an open analysis.

5.2 Zinc residue arisings

Best estimate of zinc arisings is currently 8 500 tpa (based upon the year 2000). This is made up of ash and dross from the general and wire galvanizers at approximately 55% and 94% zinc content respectively and, top dross from the continuous galvanizers at some 94%. It is estimated that this comprises 75% of the secondary zinc supply. The die-casting industry produces some 1000 tpa of recycled zinc. Therefore, the total estimates are of the order of 11 300 tpa. In highly developed zinc consuming nations only 27% derives from the galvanizing industry.

This scrap figure compares favourably with estimates from other sources, specifically the NFMIA scrap initiative.

5.3 Supply balance calculations

From the supply balance data, the **Table 12** derives local arisings

Table 12. Recycled zinc based upon supply balance.

Movement	Tonnes zinc
Supply of product to primary supplier	**-5 500**
Imported ash product	+ 6 000
Total local zinc production	+99 000
User demand	-104 500
Primary Exports	-16 500
Primary Imports	+4 500
Recycled input balance	**17 000**

5.4 Market demand calculations

From an assessment of corrected consumption figures, the balance required by the recycling industry is shown below in **Table 13.**

Table 13. Recycled zinc based upon user estimates.

Sector	**Primary allocation**	**Market demand**
Continuous galvanizing	44 000	44 000
Wire	9 500	9 500
Tube	2 100	2 100
General galvanizing	16 250	19 250
Zinc alloys	8 700	8 700
Brass alloys	7 750	7 750
Batteries	2 100	2 100
Chemicals	1 750	9 000
Secondaries	500	500
Total	92 650	102 900
Difference (= recycled zinc)		**10 250**

5.5 International Comparison

In 1996, IZA Europe carried out a study on the recycling circuit for zinc. Of the 9.6 million tonnes gross consumption of zinc, scrap arisings contributed 2.9 million tonnes although, of this figure, only 2.1 million tonnes was produced in secondary form (the balance being used in primary production). The percentage contribution per use is given in **Table 14** (with breakdown by Roskill, 2001)**.**

Table 14. World percentage supply of zinc for secondary recovery (Source IZA, Roskill 2001).

Brass scrap	42%
Galvanizing residues	27%
Die casting scrap	16%
Steel industry filter dust	6%
Zinc sheet/semis	2%
Other*	7%

*** mainly from end of life sources**

In South Africa almost all the recycled zinc arises from galvanizing (estimate of 8-9 000 tpa). The majority of die casters and brass users recycle their own scrap. Therefore, an estimate of scrap arisings would be as shown in **Table 15**.

Table 15. South Africa percentage supply of zinc for secondary recovery.

Galvanizing residues	75%
Other	25%
Steel industry filter dust	0%

5.6 Conclusions

Although all the calculations reach different results, it may be concluded that the secondary traded zinc market in South Africa lies between 11 000 and 15 000 tonnes per annum. This does not include on-site recycling as occurs with some galvanizing, brass and die-casting operations. The dominant source of zinc for this industry is the galvanizing industry where a small percentage is then consumed.

The main sector consuming traded recycled zinc is the chemicals sector. The alloys sectors (brass and zinc) rely heavily on the recycling of materials. However, much of this is processed on-site and only 10% is estimated as treated by the zinc recyclers. The issue of scrap availability and its impact upon chiefly the brass industry is dealt with in the brass industry report.

6. SOUTH AFRICAN MARKET FOR ZINC

The flow of zinc in the South African market is shown in **Figure 14**. Taken from the original study the information has been updated where necessary from the inputs of respondents to the user surveys. The three key figures determined are the total local supply of zinc, the first user zinc demand and the final local consumer zinc demand.

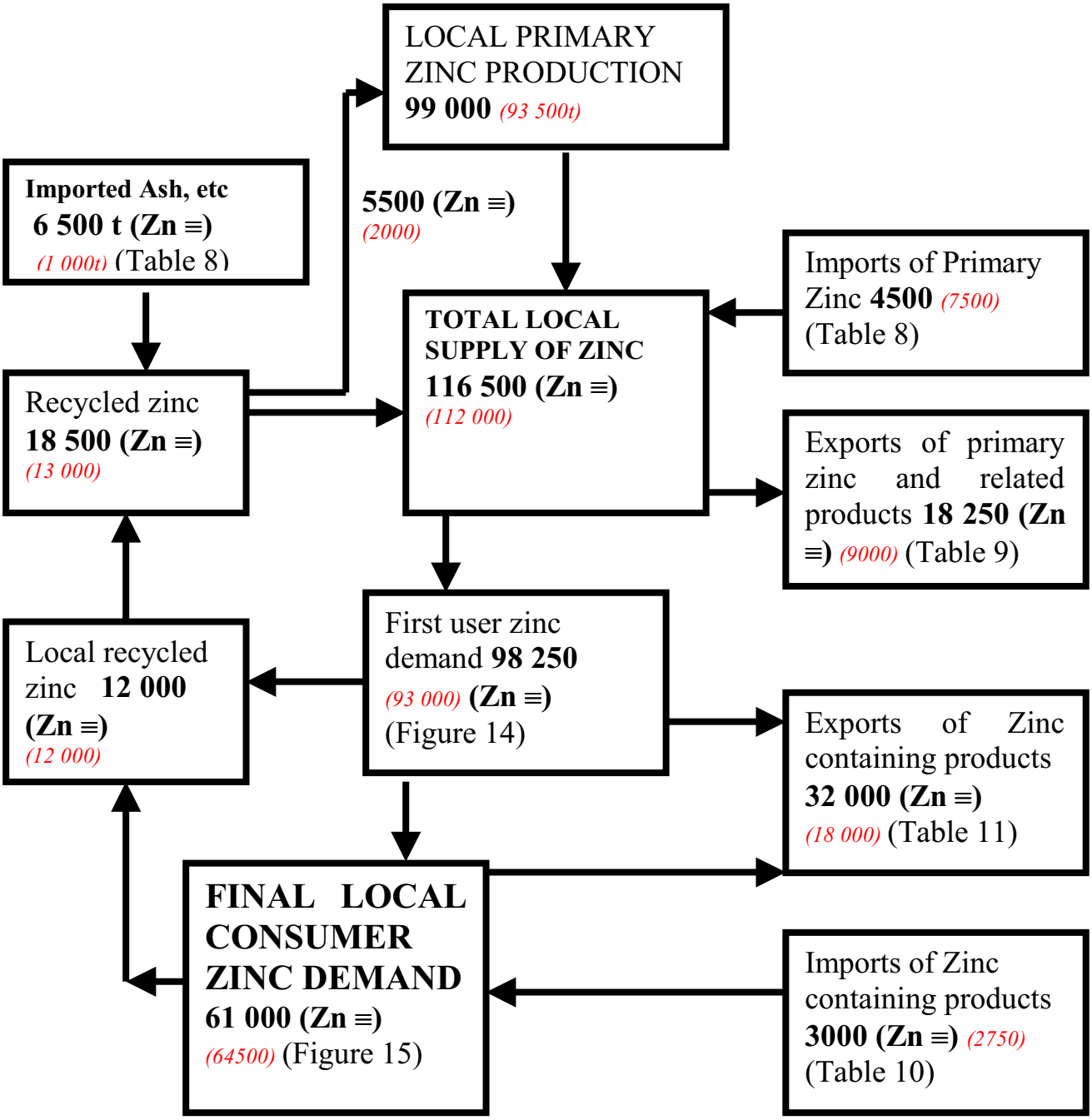
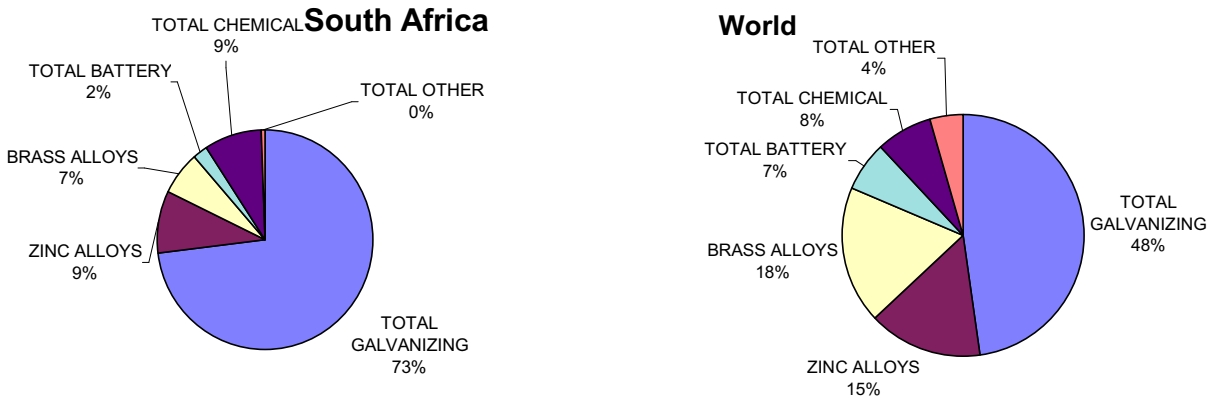


Figure 14. Zinc flows in the South African market (Zn ≡ zinc tonnes equivalent) [2000 figures (*1995 figures*)] (Source IZASA).

Local supply has increased since 1995 from 112 000 to 116 500 tonnes. Overall there has been an increase in first user demand from 93 000 tonnes to 98 250 tonnes. However, final use has declined from 65 000 to 61 000 tonnes. This reflects the poor growth in the South African economy which has led to the need for the semis manufacturers to export as the local conversion industry has under-performed.
The demand structure of the South African market is shown in **Figures 15 and 16**. From this it is clear that the galvanizing market accounts for three quarters of the market for zinc in South Africa. The brass and zinc alloy industries, whilst of similar size, account for a total of 16% of the market compared to a world average of 33%. The battery market demand is low whilst the chemicals sector demand is of a similar percentage to that worldwide. Final consumer demand patterns are not too dissimilar



to world norms. Possible opportunities depend upon the vibrancy and potential growth rates in these sectors. This is discussed in **Section 6.**

Figure 15. First user zinc demand percentages for South Africa versus World Average (year 2000).

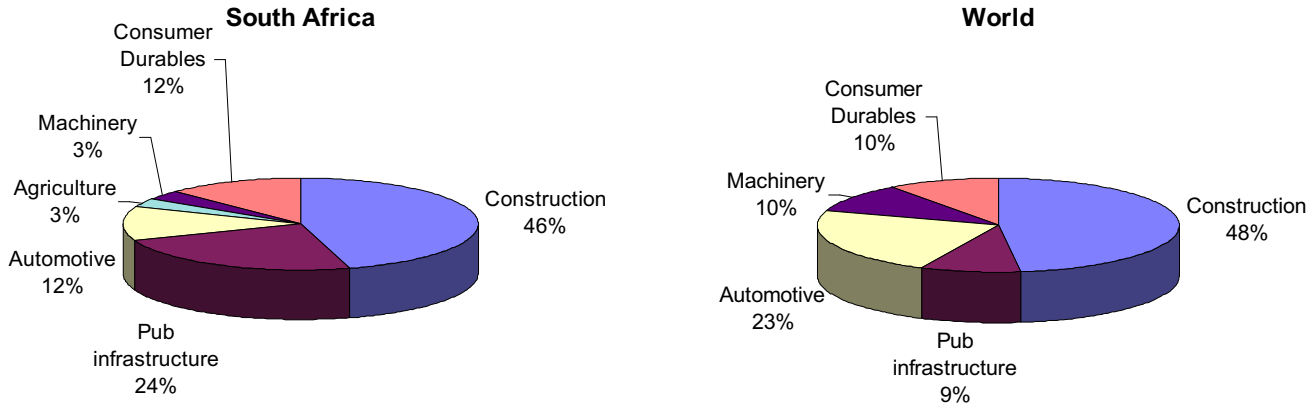


Figure 16. Final consumer zinc demand (SA estimate) for year 2000.

Of particular concern is the low intensity of zinc use in South Africa. This is shown in **Figure 17**. Also, the performance of the first user sectors over the past few years illustrates the need for major interventions (**Figure 18**).

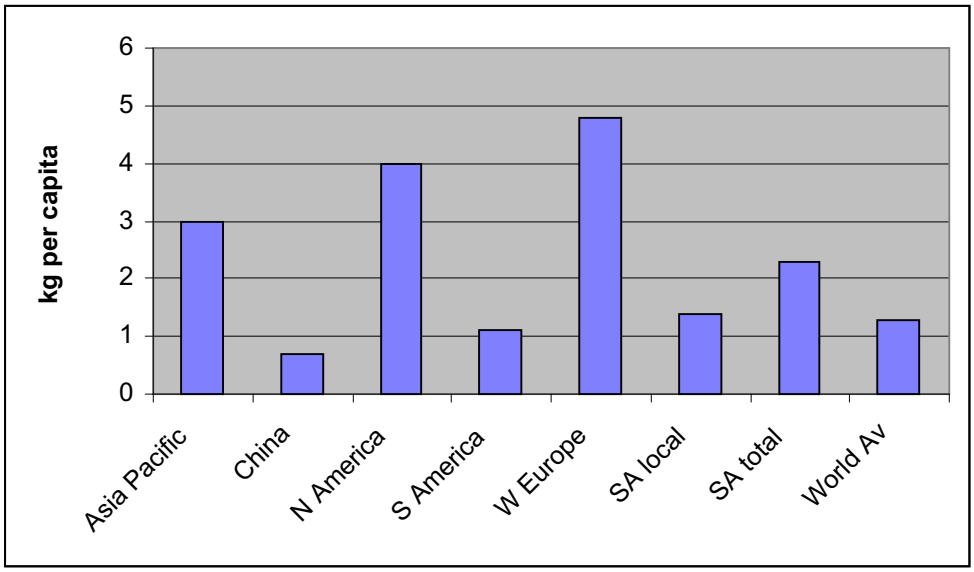


Figure 17. Comparison of per capita consumptions worldwide (Source IZA).

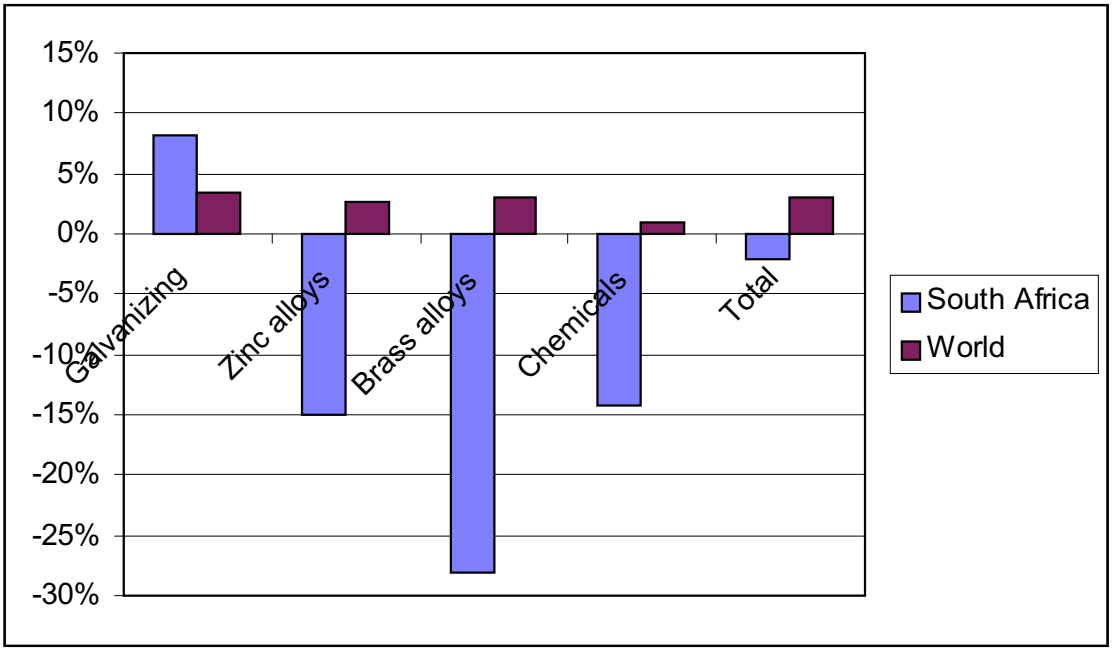


Figure 18. First user demand changes in South Africa (1995-2000) and the world (1993-1998) (Source IZA, IZASA).

7. CONSUMPTION (FIRST USER) MARKETS

The following first use markets have been identified:

1. General Galvanizing
2. Galvanized tube
3. Galvanized wire
4. Continuous galvanized sheet & coil
5. Batteries
6. Chemicals
7. Brass alloys
8. Zinc alloys

7.1 Galvanizing.

Information at a glance 2000

Employee numbers* 6 500
Value (turnover, R)
Zinc Consumption 80 000 tonnes
Association/Industry Grouping Southern Africa Hot Dip Galvanizers Association (SAHDGA), South African Wire Association (SAWA), South African Institute of Steel Construction (SAISC), Association of Steel Tube & Pipe Manufacturers of South Africa (ASTPMSA), Corrosion Institute of Southern Africa (CORRISA).
Exports (Zn tonne equivalents) 22 000
Local Product sales (Zn tonne equivalents) 36 000
Estimated imported product sales (Zn tonne equivalents) 2 000

* Due to the difficulty in allocating employee numbers, this number includes all those in the Wire Industry, all those in the Hot Dip Galvanizing Industry, but only those allocated to galvanizing in the tube and continuous galvanizing industries.

Statistics

	Employees	Zinc consumption	Exports (zinc tonnes)	Imports (zinc tonnes)
1995	**7 500**	**74 000**	**18 000**	**1200**
2000	**6 800**	**75 000**	**23 000**	**2000**

7.1.1 Respondents

The respondents to this section included the major wire galvanizers, the major continuous galvanizers, the tube and pipe galvanizers and representatives of the general galvanizing industry. The inputs from Mr Walter Barnett of the SAHDGA, Mr Martin Done of the astpmsa, Mr Hennie De Klerk of the SAISC, Mr Jaco Oosthuizen of SAWA, and Mr Petrus Brits of the Agricultural Research Council are also acknowledged together with the inputs of SAISI.

Industry players	Number of respondents
General Galvanizers	8
Continuous Galvanizers	2
Tube & Pipe	2
Wire	5
Steel Fabricators	5

7.1.2 Overview

The general jobbing galvanizing industry is characterised by a widely geographically spread number of facilities. If divided into large (>12m), medium (<12, >6m) and small (<6m) facilities, then all the major centres are represented by adequate facilities. A small number of facilities produce in-house product such as heat exchangers, nestable products (culverts, road barriers, etc) and electrical transmission systems. These companies in particular have exports ranging up to 75% of production. Much of the general jobbing galvanizing goes into the steel fabrication market. This sub-sector has been the subject of a cluster study and has formed a recognised (dti) Export Council.

Continuous galvanizing is carried out at Iscor Vanderbijl and Deferco at Saldanha. The latter operation (a JV between the IDC and Deferco) was established for export using Saldanha Steel product as input for the galvanizing line. Current business is trading into the steel services centres with a 50:50 market split between the EU and US. Iscor trades product in the local, African and overseas markets.

Online semi-automatic pipe and tube galvanizing is restricted to two operations, Macsteel Tube & Pipe and Robor Tube. Capability exists for up to 219mm (8 inch) product. Exports vary considerably depending upon exchange rates with markets including China, EU and US. Although current exchange rates favour exports, opportunity exporting will always be variable and value adding is necessary. This sub-sector has been the subject of a cluster study and has formed an Export Council, although not funded by the dti.

Wire galvanizing has undergone a change in structure over the past few years. Whereas some 5 to 10 years ago Consolidated Wire Industries (CWI) and Sharon Wire (Cape Gate) dominated the industry, the industry has shown some degree of fragmentation. This has resulted in an increased number of independent companies entering the market. This sub-sector has been the subject of a cluster study and has formed a recognised (dti) Export Council.

7.1.2.1 Zinc consumption figures

Table 16. Change in consumption within the galvanizing industry

Zinc consumption	1995 Zn tonnes	2000 Zn tonnes	change
General galvanizing[1]	17 500	19 500	+10%
Continuous galvanizing[2]	40 000	44 000	+10%
Tube & Pipe galvanizing[3,4]	2 100	2 100	0%
Wire Galvanizing	9 500	9 500	0%

1. taken as allocated by Zincor less 4 000t

2. increase in capacity by year 2000
3. some tube & pipe is galvanized in general facilities
4. increase in capacity by year 2000

From the above information it is clear that galvanizing has shown a 10% growth over the past 5 years.

The general galvanizing industry has had plant closures but, on average, these have been balanced by new plant coming on stream.

Continuous galvanizing has shown growth due to the increase in capacity available with the commissioning of the Deferco plant. Overall efficiencies have been improved with a reduction in capacity at Iscor.

The tube and pipe industry has shown an increase in capacity but no growth. The reason for this has been discussed already.

Wire galvanizing has shown a redistribution in consumption towards more players. Local consumption has grown but more players have resulted in no change in capacity utilization. However, there has been little change in galvanizing capacity.

Table 17. Change in galvanizing capacity utilization

Sub-sector	% capacity utilization 1995	% capacity utilization 2000	change
General galvanizing	60%	70%	+10%
Continuous galvanizing	88%	95%	+7%
Tube & Pipe galvanizing	95%	75%	-20%
Wire galvanizing	60%	60%	0%

7.1.2.2 Main industry customers

Table 18. Major customer base per galvanizing sector

Sub-sector	Construct-ion/ incl mining	Public infra-structure	Machinery	Auto	Agriculture	Consumer
General	35%	25%		5%	10%	25%
Continuous	50%	10%	5%		20%	15%
Tube & Pipe	35%	20%	5%	5%	15%	20%
Wire	25%	Included in Cons-truction	25%		33%	17%

Key
Construction = Mining, Building
Public Infrastructure = Municipal, Transport, Roads, Trains, Telecoms, Utilities
Automotive = Cars, Trucks, Buses
Machinery = Earth moving, Fixed, Mining
Consumer = Batteries, House products, Security

7.1.2.3 Industry trade

Table 19. 2000 Industry trade (zinc tonnes)

Sub-sector	Exports		Imports	
	tonnes	Zn≡ tonnes	tonnes	Zn≡ tonnes
General	30 000	2 000	0	0
Continuous	300 000	16 500	45 000	2 000
Tube & Pipe	21 000	1 000	2 000	100
Wire	125 000	3 750	5 300	160

7.1.3 Sector analysis

7.1.3.1 General Galvanizing

7.1.3.1.1 Statistics

The total capacity of the general galvanizing industry is estimated at 400 000 tonnes of steel per year (2001). Clearly, product mix could influence this value to some extent.

Local steel sales dictate the amount of available galvanizeable steel. The primary alternative form of corrosion protection is through the use of heavy-duty coatings (HDC). The change in local steel sales is shown in **Table 20** together with the changes in the use of HDG and HDC as forms of corrosion protection. The increase in market share of HDG over HDC is clearly evident. Projected growth in steel sales of 5% should yield an added 1000 tonnes of zinc consumption with no increased promotion intervention.

Table 20. Local sales to general galvanizing

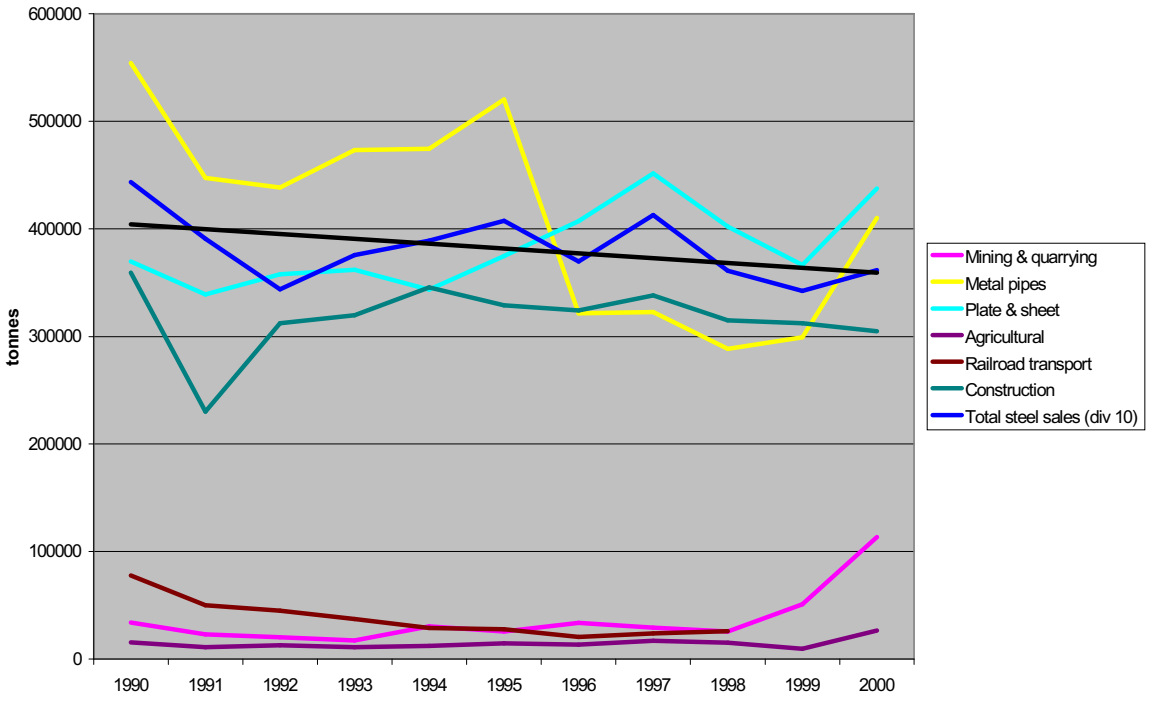
	1995	1996	1997	1998	1999	2000	2001	2002-4[6]
Zinc consumption[1]	17,500	17,000	17,500	16,750	17,000	19,500	20,500	21,500
Local steel sales[2]	3,555,980	3,376,086	3,805,587	3,322,792	3,125,455	3,206,227		3,366,500
Local paint sales[3]				6,366	5,015	4,600		4,750
Painted steel[4]				848,800	668,667	613,333		633,333
Galvanized steel[5]	250,000	242,857	250,000	239,286	242,857	278,571	292,857	307,143
Ratio Pt/HDG steel				3.5	2.8	2.2		2.1

1. Zinc consumption corrected for other suppliers (including tube)
2. Excluding wire (tonnes) **NB not all available for galvanizing**
3. Heavy duty coatings (l x 1000)
4. Calculation based upon standard method @ 80% solids, 200um
5. Based upon 7% pick-up
6. Projection of growth

An interesting observation from **Table 20** is the erosion of market share held by the organic paint industry. Although figures are only available for the past couple of years the trend is noticeable. As the tonnes of zinc sold into the general galvanizing industry is related to steel tonnes sold, it is necessary to protect and build upon this improving market position.

Major steel sales are shown in **Figure 19** with sales since 1990

Figure 19. Steel product sales and sales into selected sectors



The overall decline in steel sales is clearly shown by the trend line. The tube and pipe sector has shown a recent improvement. Increase in construction in the mining sector is clearly visible. The machinery sector has remained constant in demand over the past few years. Unfortunately, different statistics reporting was introduced in 1998. As a result it is difficult to compare figures before and after this date.

7.1.3.1.2 Competition/Efficiency

As discussed, the general jobbing galvanizing industry is characterised by a widely geographically spread number of facilities. Each centre has a number of players such that price competition is fierce. However, those with larger bath facilities are able to exert greater influence on pricing for jobs requiring the larger facilities. Prices tend to be higher at the coast where competition is less intense. However, the appearance of new, small and often “backyard” type operations impact upon pricing and the margins of existing players. In all areas customers can influence pricing to a greater or lesser extent. The niche operators with in-house products are internationally competitive and focused upon exports. Comparisons with HDG prices internationally show the industry to be price competitive.

The primary product competitor is heavy-duty coatings (HDC). This industry has undergone severe restructuring over the past couple of years. New entrants have resulted in 5 major players but only 2 manufacture locally. Nevertheless, the small size of the local steel fabrication industry has resulted in competitive pricing structures. Although some major projects have been lost to HDC, overall the performance of HDG is encouraging (see **Table 20**).

The SAISC carries out regular surveys of activity in its sector. Although it is some time since the publication of the last study (1999), the same comments apply. Capacity utilization is low (around 75%) with the number of large government spend projects being minimal. Despite the formation of the SA International Steel Fabricators Business Council (SAISFBC - an export council with assisted dti funding), the industry faces a number of problems common to South African business – poor availability of trained persons, poor productivity and no margins, and concerns about the cost of corrosion protection. The latter is being addressed through an industry initiative although the restructuring of the paint industry (together with a focus on work outside of South Africa) highlights the parlous state of the steel fabrication in the country. Consolidation, closures (such as the recent demise of Girder Naco) and export focus (through the SAISFBC) provides the only means of survival for this currently weak industry.

The S A Hot Dip Galvanizers Association represents the industry in the market place. This body primarily focuses upon the development of the competence of the industry and assisting members in targeting projects and applications. The Association also offers training and education to member personnel and specifiers on a regular basis. However, a co-coordinated industry programme has never been put in place.

A major initiative is currently underway with the Danish Agency for Cooperative Education and Development (DANCED) to assess the requirements of the industry needed to meet the more stringent environmental regulations being considered in South Africa.

7.1.3.1.3 Markets

Markets served by the general galvanizing industry mirror those available to the steel industry. It is clear from the tables above that opportunities are available in the mining, machinery and construction sectors. However, with the exception of the machinery sector, the industry is reliant upon cyclical businesses. The major exception to this is the use of HDG in the security fencing industry.

There has been a great deal of success in competing with organic coatings as shown in **Table 20**. Indeed, overall, the ratio of HDG steel to painted steel has grown over the past years despite the overall low growth in the steel construction industry. The HDG industry has had great success, particularly in coastal areas. An example would be in the security business where over 90% of fencing, gates, etc. is galvanized at the coast in South Africa.

Estimates of sales per market sector are shown in **Table 21** (based upon galvanizer input).

Table 21. Current galvanizing percentage consumption per market sector
(1995 figures in brackets)

Region	Construction	Public Infrastructure	Transport	Consumer	Other	Exports
Western Cape	35% (40%)	15% (10%)	15% (20%)	25% (20%)		10% (10%)
KZN	20% (20%)	10% (10%)	15% (15%)	30% (30%)	20%	5% (10%)
Gauteng	69% (65%)	32% (28%)	1% (1%)			8% (6%)

Key to descriptions:
Construction:
Factory buildings and their roofs, mining, fencing of projects, general high-rise buildings, etc.
Public Infrastructure:
Including S.L. poles, stadiums, fencing for municipalities, street furniture
Transport
Highway bridges, roads, railways and guardrails.
Automotive:
Boat trailers, chassis and fittings
Consumer Products:
Fencing for the general public, gates, burglar bars and general items for houses

Although HDG has a good market share of the steel fabrication business, there are still areas of uncertainty in the relationship between the HDG industry and the steel fabricators. General discussion with customers and end users continually repeat issues of poor service (quality, delivery and communications). Clearly, some of the galvanizers perform better than others. However, it is suggested that, similar to those held in Europe, a survey be carried out to identify the key issues that need to be addressed by the industry.

Focus of attention in the market place is in market penetration activities. Since the major thrust into mining some 10+ years ago (where HDG now has a good albeit patchy market acceptance) no new market development work has been carried out to finality. It is suggested that although the SAHDGA may be the vehicle to carry out such work, there is no capacity to do this currently.

7.1.3.1.4 Opportunities

The macro-economic analysis in this report indicates that there are sectors showing promise for further development. However, in addition to this, major opportunities have identified in the following areas –

1. Increased use of HDG in utility poles replacing wood and concrete. This initiative is being pursued with a major tube manufacturer.
2. Increased awareness of the benefits of HDG rebar for concrete structures.
3. Increased use of HDG to protect scaffolding
4. Increased use of HDG in chassis for bakkies, etc.
5. Increased use of HDG in Street Furniture.

These projects alone could provide an additional 5 500 to 6 000 tonnes of zinc consumption in the local market. All these markets are able to draw on overseas experience to fast track their implementation. The importance of these projects is clear in that the industry cannot rely upon a healthy steel fabrication industry to produce tonnage availability for galvanizing.

7.1.3.2 Continuous galvanizing

7.1.3.2.1 Statistics

Analysis of the sector sales in this market proves difficult due to the changes in reporting of figures since 1998 as mentioned previously. Current consumption in roofing type product is 57 000 tonnes (2000 figure). General trade figures are illustrated in **Table G7**.

Table 22. Sales & trade figures for continuous galvanized products (Source SARS, Iscor).

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001-4[1]
Zn ctd local sales						128,523	62,379	100,293	57,075	
Zn ctd steel imports	56 670	41 827	36 653	14 634	27 475	36 480	30 189	41 655	29 000	30000
ZnAl ctd steel imports	0	0	0	0	13338	13132	15904	9201	13400	13000
Zn ctd steel exports	288563	267544	285538	265108	155511	230419	299392	242449	290362	300000

1. Forecast based upon best estimates

It is clear from **Table 22** that sales of 55% ZnAl product have not gained a significant share of the local market since its introduction in 1996. In fact sales have been relatively constant over time.

Local sales tonnes do not reflect changes in gauge over the past few years (see discussion below). Some of the reduced sales can be the result of fairly aggressive gauge reduction. A similar comment is valid for exports.

7.1.3.2.2 Competition/efficiency

There are currently 2 producers of continuous galvanized sheet in South Africa – Iscor Vanderbijl and Deferco Steel Processing in the Western Cape. DSP is a 50:50 Joint Venture between, ultimately, Deferco Participation Holdings of Switzerland and the IDC. The DSP operation is primarily an export operation. The zinc consumption ratio between the two companies is approximately 2:1 Iscor: DSP. There are 2 lines currently in operation at Iscor with a total installed capacity of 42 500 tpm (510 000 tpy) with DSP having a single line producing some 24 000 tpm (288 000 tpa). The DSP operation was established for export using Saldanha Steel product as input for the galvanizing line.

There have been some inroads by BHP Galvalume into the local market over the past few years (13 400 tonnes in 2000). Successful projects have been advertised widely. However, a campaign to counter some of the claims has been put in place. However, overall market penetration is very small. Also, internationally there appears to be an excess of production over demand for the 55%ZnAl (Galvalume type) coated steel

products. A 55%ZnAl coating plant is present in Kenya and the group Safintra also operates in South Africa.

Local market demand is buoyant with an active number of customers (with in excess of 9 players in the metal roofing sector alone).

There has been a marked drive to lower gauges in the past few years with demand for <0.4mm material doubling in meterage every year for the past 3 years. Similarly, there has been a tendency to run at lower galvanizing thickness levels. Within the ambit of the African market, the fact that local producers have met the challenge bodes well for future sales.

7.1.3.2.3 Markets

Demand in the roofing sector is high with galvanized sheeting accounting for almost half of all the roofing material usage within South Africa. The local metal roofing market exceeds 100 000 tpa. Sales into the light engineering structural market are buoyant and reflect increased activity in this sector. **Table 23** shows the building activity trends over the past few years in square metres to indicate roofing needs. This table also indicates the areas where growth opportunities exist.

Table 23. Square metres of buildings completed by type of building: 1995 – 1999 (Source BIFSA).

	Weighting based on square meter	Square meters				
		1995	1996	1997	1998	1999
Houses	63.06%	3,294,719	3,474,864	3,250,220	3,922,684	3,850,154
Townhouses	11.20%	1,299,217	1,301,605	999,023	896,803	683,559
Flats	2.65%	369,087	468,788	390,146	252,854	162,034
Additions / alterations	23.09%	1,371,183	1,378,543	1,416,741	1,207,919	1,410,003
Total residential	72.06%	6,334,206	6,623,800	6,056,130	6,280,260	6,105,750
Offices	18.72%	330,927	527,215	655,944	659,576	443,158
Shopping Space	17.47%	350,222	462,288	571,196	576,078	413,463
Industrial	35.60%	716,771	799,743	1,029,729	845,512	842,553
Additions / alterations	28.22%	567,006	619,381	747,357	698,394	667,865
Total non-residential	27.94%	1,964,926	2,408,627	3,004,226	2,779,560	2,367,039
Total		8,299,132	9,032,427	9,060,356	9,059,820	8,472,789

The 2001 SARB figures are not encouraging in terms of the state of the building and construction industry. However, what is clear is that a slight upturn was noted at the end of last year. Clearly, short-term activity will be very dependant upon the interest rate climate. Nevertheless medium to long-term growth is assured. Current DSP business is trading into foreign steel services centres with a 50:50 market split between the EU and US. Iscor trades product in the local, African and overseas markets.

7.1.3.2.4 Opportunities

Opportunities have already been identified in the steel framing, truss and roofing markets. It is hoped to set up a working group at the Institute of Steel Construction charged with specific focus on this market. Considerable support information is available internationally via bodies such as the Canadian Sheet Steel Building Institute and the North American Steel Framing Alliance. Experience shows that a move from proprietary systems to more generic codes, such as those in North America, assist in the market acceptance procedure. This should be pursued aggressively. An extra 10% consumption in pre-galvanized product (locally) equates to an additional 500+ tpa zinc consumption.

7.1.3.3 Tube & Pipe

7.1.3.3.1 Statistics

It is estimated that some 1800 people are employed in pipe manufacture. The industry capacity is of the order of 500 000 tpa (R1.3bn). The industry is divided into small (<219mm) and large bore manufacturing. The major companies are listed in **Table 24.**

Table 24.The tube & pipe companies in South Africa

Company	Products	Mkt share(con[1])	Mkt share (str[2])	Ownership
Robor	Conveyance/Structural	50%	50%	BarlowWorld
Macsteel T&P	Conveyance/Structural	25%	23%	Macsteel Intl
Trident Sterling	Conveyance/Structural	6%	8%	Anglovaal
Bosal	Structural		8%	Private (K Boss)
Tubecon	Conveyance/Structural	3%	6%	Private
Nevan Matthews	Conveyance/Structural	6%	2%	Private
Andrag	Conveyance	3%		Private
Hall Longmore	Conveyance/Structural	4% (80% lge bore)	(70% lge bore)	Murray & Roberts
Group 5	Conveyance/Structural	(20% leg bore)	(30% lge bore)	Group 5
Iscor Seamless	Conveyance	Export API		Iscor

1. conveyance
2. structural (includes mechanical non specification product)

Export statistics are shown in **Table 25.**

Table 25. Export statistics in the tube and pipe industry

1990		1995		2000	
tonnes	Tones Zn	tonnes	Tones Zn	tonnes	Tones Zn
40 000	2000	15 000	750	21 000	1000

7.1.3.3.2 Competition/efficiency

The main producers using online semi-automatic plant are Macsteel Tube & Pipe (owned by Macsteel International – steel merchant & trader) and Robor Tube (owned by Barloworld). However, Monoweld (part of Barloworld) has a tube galvanizing line and some of the larger galvanizers galvanize tube & pipe on an intermittent basis.

The tube & pipe industry has been the subject of a cluster study survey. It is not the intention of this report to repeat the findings, however, the following issues were highlighted:

1. The industry is characterized in the large and small bore sectors by a few players competing in a relatively small market.
2. In small-bore conveyance tube (<219mm) significant substitution has occurred by alternative materials (mainly plastics).
3. Costs of production locally were not internationally competitive. This has been addressed over the past 3 – 4 years with major expenditure in plant in the small bore (Macsteel and Robor) and large bore (Hall-Longmore) markets.
4. The customer base is undemanding in that price is the key factor in sales.
5. Key to future success lies in the more developed products (graded tube, special products).

The industry has been successful in containing costs and improving overall productivity. However, market development strategies have been less successful due to a lack of partnership with the distributors and end users. The industry is represented by the Association of Steel Tube & Pipe Manufacturers of South Africa (astpmsa). This Association is particularly active in promoting joint industry (supplier) marketing drives, supporting exports and monitoring imports (and registering anti-dumping cases where necessary).

7.1.3.3.3 Markets

The tube market is characterised by 2 distinct markets – structural and conveyance. The structural market includes everything from lampposts through to arch tubing used in installations such as stadiums, etc. In the small bore range this market is of the order of 160 000 tpa. Much of this product is available for galvanizing. The conveyance market (75 000 tpa) includes galvanized water piping (50%). Organic coatings eventually coat much of the non-galvanized product. Major markets include the mines, municipalities, agriculture and residential (government and private).

Structural applications in the tubing industry are growing as it substitutes alternatives such as wood and concrete. The galvanized conveyance market has shrunk

considerably since the 1980s with copper and latterly plastics becoming more widely used in water conveyance. Current market estimates are of the order of 10 000 tpa.

Exports vary considerably depending upon exchange rates with markets including China, EU and US. Although current exchange rates favour exports, opportunity exporting will always be variable and value adding is necessary. Transport of tube & pipe to overseas markets can be up to 20% of the final product cost meaning that focus should be on local (Africa) markets.

7.1.3.3.4 Latest developments

The introduction of structural tube with guaranteed properties has assisted in a change from conventional to tubular members in structures. The introduction of these products was in 1996.

Some R&D is being carried out in the area of light-gauge galvanized water piping but it is early days yet. Additionally, a major thrust has been undertaken in the revision of SABS standards and the production of user guides. These still have to show any impact upon consumption patterns.

7.1.3.3.5 Opportunities

The American Iron & Steel Institute (AISI) has identified the use of galvanized steel utility poles as a marketing opportunity. A local study to identify opportunities has been completed (2001). This still awaits implementation but an opportunity exists (thousands of tones of tube). This initiative should be driven with the assistance of the SAHDGA and the astpmsa.

The introduction of a lightweight domestic piping system holds some promise. This study is currently being carried out through the astpmsa.

In the area of electrification an opportunity exists for some in excess of 2000 tpa additional zinc consumption. This excludes increased use of galvanized utility poles where an overall market for 20% of the current 80 000 tonnes exists. This is equivalent to 4 000 tpa of zinc consumption.

7.1.3.4 Wire Galvanizing

7.1.3.4.1 Statistics

The performance of the South African wire industry over a 10-year period is shown in **Figure 20**. The reliability of data collection before 1997 is questionable as not all producers reported data. It is important to understand **Figure 20** fully. Wire production figures are derived from local sales of wire rod. **Figure 20** indicates that there has been a steady increase in production. However, this is not the case. The rise in wire rod sales is as a result of substitution of imports previously used by the independent wire manufacturers. The reason behind this is discussed below.

However, it is clear that there has been an increase in exports of galvanized wire, this now forming an important activity of the wire industry. There has been no major

change in supply of zinc to the wire industry. The galvanizing capacity of the industry has not changed over the past 5 – 10 years. It is estimated at 300 000 tpa (including Haggies who essentially are in a different market than the other players). The total local wire production appears to be of the order of 4-500 000 tpa. Employment in the industry is estimated at 2000 people (based upon full compliment).

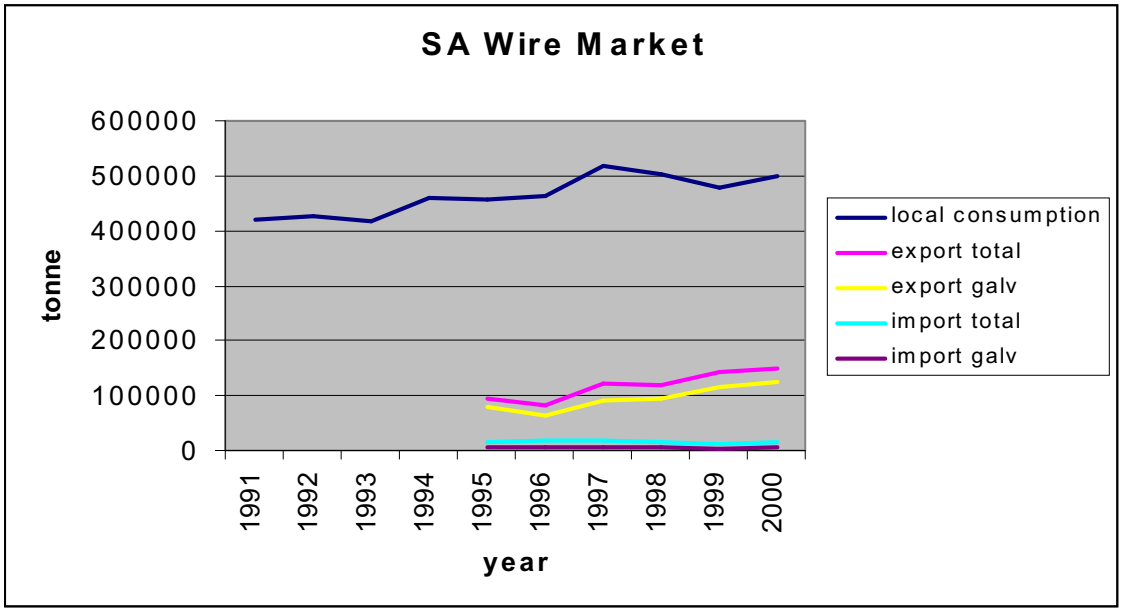


Figure 20. Market performance of the SA wire industry.

7.1.3.4.2 Competition/Efficiency

The total production capacity of the SA wire industry is 480 000 (measured as local sales of wire rod). There are some 20 or so wire manufacturers in South Africa. Of these the largest are Sharon Wire in Vanderbijl Park (±130 000 tonnes), Consolidated Wire Industries in Vanderbijl Park (±95 000 tonnes), Barnes Fencing in Isando (±12 000 tonnes), Allens Meshco in the Cape (±80 000) and Haggie Rand in Johannesburg (140 000 tonnes). These represent 90% of the total production capacity in South Africa. Supply of material is from Iscor (information via John Venter – Iscor HQ) (40% of the supply to wire drawers) and Scaw Metals.

CWI is a 50:50 JV with Iscor and Haggies. Until recently, Iscor supplied CWI with wire with limited supply to the small independents that were forced to import as a matter of course. However, once Scaw bought Haggies and started to supply CWI, although retaining part ownership of CWI, Iscor started to move product via the independents. These have grown over the past few years at the expense of Cape Gate and CWI.

The ownership of galvanizing capacity is quite complex. Cape Gate is an independent family run business (the Friedman family). As mentioned, CWI is a Joint Venture between Scaw Metals and Iscor. Rick Allen, the owner of Allensmeshco, owns Independent Galvanizers in Vereeniging (former members of the HDGASA), Wireforce Steelbar and 50% of the galvanizing plant at Hendock (run as a JV with Hendock). Barnes Wire (also a family concern – owned by Doron Barnes) has a

continuous galvanizing line in Isando. Therefore, there are 5 companies galvanizing wire currently, Cape Gate, CWI, Allensmeshco (through Independent Galvanizers), Barnes Wire, and Hendock. Of these, 3 are members of the HDGASA (Cape Gate, CWI and Hendock) and 4 are members of the SAWA (Allensmeshco, Barnes Wire, Wireforce Steelbar and Hendock).

7.1.3.4.3 Latest Developments

An interesting new development is the presence of Bekaert in Cape Town. They are importing Galfan wire from their overseas operations and weaving for fencing product (trade name Bastion Fencing Systems). This product is very material intensive. Indeed CWI and Allensmeschco are in discussions with Bekaert. Clearly, although this development could be viewed as a threat, there may be opportunities for export in future. CWI, Allensmeshco and Cape Gate have expressed interest in Galfan over the years.

There is a programme currently running to revisit the local agricultural market for fencing. The main wire suppliers have shown an interest. In addition, funding has been secured for the completion of a 10-year exposure campaign by the SABS. This information will be transferred to the marketplace. In addition, the SABS is currently reviewing (internationalising) the wire specifications. This should assist the exporters of product.

7.1.3.4.4 Markets

Exports are primarily to the USA, the EU. However, a large export market also exists in the Far East, Australasia and Africa. It is estimated that at least half of all the galvanized wire produced in South Africa is exported. Imports do not pose a threat at the moment being less than 4% of the total local consumption figure. It is estimated that farmers buy about 200 000 tonnes of wire annually. Most of this is sold via the Co-ops. Local purchasing is based upon price with product complying with local specifications. The local market is best described as shown in **Table 26**.

Table 26. Percentage consumption of wire by specific markets.

Construction	Agriculture	Security	Industry*
25%	33%	17%	25%

* includes all other – hardware, baskets, trolleys, etc

A SA Wire Association (SAWA) exists. To date the chief activity has been the setting up of an Export Council. Currently, some 360 000 tonnes of wire rod is exported. The objectives of SAWA are to convert this to wire. However, all the wire manufacturers are currently operating at under-capacity. Although the fall in the Rand may be viewed as an advantage for exports, steel, zinc and transport contribute 70% of the input price base. These are all based in US dollars and therefore, it is clear that local cheaper labour and electricity rates are unable to counter the rise in the other costs. Therefore, some export pricing system would be attractive in boosting exports. The current activities provide an opportunity as the Association is looking for a home and new management. Neither Cape Gate nor CWI are members of the Association. This is primarily due to the view that the independents have eroded market share locally, and neither Cape gate nor CWI wish to share their export markets with other players.

However, there has been an approach by SAWA for Cape Gate and CWI to reconsider their position in respect of membership of SAWA. CWI have now joined the Association.

7.1.3.4.5 Opportunities.

There exists capacity in this industry for greater production using existing facilities. It is clear that imports are not a threat. Increased use through an industry initiative looking at the fencing industry was explored but not followed through by the Hot Dip Galvanizers Association. The formation of SAWA provides an avenue to increase African consumption and it is recommended that this initiative be followed via this body. Just matching the 20% growth in the local market for wire in the last 5 or so years would increase zinc consumption by 2000 tonnes per year.

7.2 Batteries

Information at a glance 2000

Employee numbers (97) **3813**
Value (turnover, R)
Zinc Consumption **2100 tonnes**
Association/Industry Grouping **Non for primary cells**
Exports (Zn tonne equivalents) **100 tonnes**
Local Product sales (Zn tonne equivalents) **2000 tonnes**
Estimated imported product sales (Zn tonne equivalents) 900 tonnes

Statistics

	Employees (all battery mfrs)	Zinc consumption	Exports (zinc tonnes)	Imports (zinc tonnes)
1995		**4570**	**300**	**1500**
2000	**3813 (1997)**	**2100**	**100**	**900**

7.2.1 Respondents

The respondents to this section included the major supplier of primary zinc batteries, importers and traders, a number of contacts in the secondary Lead Acid battery industry, the Minerals Bureau and Stats SA.

Industry players	Number of respondents
Primary Battery Manufacturers	1
Lead Acid Battery Manufacturers	2
Traders	2
Government bodies	2

7.2.2 Overview

The size and value of the international battery market is difficult to estimate. The mass markets are in consumer primary and secondary cells, automotive batteries and

in industrial batteries for stationary and mobile power. In 1989 the annual markets in the USA for primary and secondary batteries were estimated at $2.3bn and $4.2bn respectively. In 1991 the world battery market was said to be $21bn with 40% being primary batteries, 60% secondary batteries. A more recent estimate (1997) gave the world market for small consumer secondary cells alone as 2 billion units of value $3 – 5bn. In 1999, the Japanese battery market was estimated at $8bn of which 25% was for primary cells.

Zinc is used widely in zinc primary cells such as the:

Zinc-Carbon cell,
Alkaline-Manganese cell,
Zinc-Silver-Oxide button cell,
Zinc-Mercury-Oxide button cell and,
Zinc-Air cell.

In addition, zinc primary cells such as the Zinc-Silver-Oxide reserve cell are used in specialist applications such as for torpedo batteries.

The most common secondary cell is the Lead-Acid battery. In South Africa there is a Battery Manufacturers Association (SABMA). Its focus is upon ensuring that sufficient recycled lead is available to the industry. Indeed, primary lead is only used as a supplement. The system works through the application of a R25 levy at the point of sale on all batteries sold if a battery is not returned (the "one for one" system). Exceptions apply in the case of OEM batteries. Although some batteries miss the system, these are collected through the scrap industry and overall collection is estimated at 83%. Currently, there are 4 secondary lead smelters in South Africa (Fry's Metals, First National Batteries, Lead Processing, Dixon Batteries). Current output (2000) estimates are shown in **Table 27**.

Table 27. Current SA lead production for lead acid batteries.

Refined soft lead	20 603 tonnes
Antimonial Lead Alloys	20 781 tonnes
Calcium Lead Alloys	4 770 tonnes
Total	**46 154 tonnes**
Total SA Pb acid battery production	**2.88 million units pa**

As there is no local primary smelter and the estimated capacity of the secondary smelters is 62 500 tonnes, there is an opportunity for the importation of secondary lead to increase capacity utilisation from the current 74%.

Table 28 shows the market share of the local Lead Acid battery producers. The SABMA has been successful in maximising the leverage available in obtaining import credits against the MIDP. In this regard it has been successful with Sabat-Willard exporting batteries with all the BMW and Volkswagon exports to all countries except for the USA.

Table 28. Current SA lead acid battery manufacturers

Company	Market Share	Comments
First National Batteries	48%	Brands – Chloride, Exide, Raylite. Own the Battery Centre retail chain
Sabat	23%	Owned by Altron
Willard	18%	
Dixon	8%	
Freestart	2%	
Others + imports	1%	

Zinc is used in secondary cells such as the:

Alkaline-Manganese cell,
Nickel-Zinc battery and,
Zinc-Air battery.

The latter has the advantage that it can be mechanically recharged in that a bed of zinc powder is compacted onto the current collector frame (mounted as a cassette) flanked on both sides by air electrodes. The cassette can be replaced and recycled at a central facility. Currently technologies are under development in Germany (a Mercedes Benz 410 postal van having been tested with an 8 module (each with 66 cassettes) system). Another version is available via Metallic Power in California. In the area of vehicle traction, the US Advanced Battery Consortium (USABC) has defined the power requirements for future application. This stems from the 1990 California State legislation on environmental pollution.

Lithium secondary batteries are widely used in modern technology items such as computers and cell-phones.

By far the most common primary cells are based upon the zinc-manganese dioxide couple, either the zinc-carbon cells or alkaline cells. In the former, the positive terminal is a carbon rod surrounded by a powder mixture of manganese dioxide mixed with carbon powder. The electrolyte is a mixture of ammonium chloride and zinc chloride. The negative terminal is the zinc can containing the mixtures. Over the years to improve shelf life, temperature and current drain performance the zinc chloride (or heavy duty) cell was developed. Improved manganese dioxide quality and the replacement of the ammonium chloride entirely by zinc chloride permits a higher current drain potential. The more advanced alkaline cells use potassium hydroxide as the electrolyte and the use of finely divided zinc powder as the negative electrode.

The primary battery industry in South Africa is concentrated at one facility in Port Elizabeth. A single plant is in operation producing the zinc-chloride cell under the name of Ever Ready. In South Africa, Duracell (part of the Gillette Corporation) owns Ever Ready SA. This ownership was as a result of the divestment of Ever Ready from South Africa during the period of sanctions. Therefore, in South Africa a marketing agreement with Ever Ready means that the local production unit is limited to supply to the South African market (which includes the SADC countries). Alkaline batteries are all imported. Ever Ready alkaline batteries are distributed under the Energiser label in competition to the Gillette Duracell range.

Worldwide the market for zinc-carbon batteries has declined. The European market is small with almost all supply coming from Spain. Duracell own a zinc-carbon plant in India and China. However, import tariffs into these countries preclude the export of pellets (battery cans before drawing) from South Africa. Alkaline batteries have replaced most of the old zinc-carbon batteries except in the developing world where first cost is still an issue. In Africa there are plants in Zimbabwe, Tanzania, Kenya (currently producing three times that of the PE plant) and Egypt. The Ever Ready plant is diversifying by exporting layer stacks (for multiple stack back-up batteries - PM 9's & 10's (all 6 volt)) to Europe. Zinc consumption per size (for zinc-chloride) is shown in **Table 29**. Alkaline batteries have a similar percentage of zinc per battery but are heavier than the zinc chloride batteries.

Table 29. Zinc consumption per common battery size.

Battery size	Zinc use
D	17g
AA	4.5g
C	11g
Layer stack (per cell)	7g

7.2.3 Markets

The consumption of zinc for battery manufacture in South Africa has declined from 4568 in 1995 to 2095 in 2000. Production at Port Elizabeth has dropped almost 50% since 1995. There are three major reasons for this. They are:

1. Electrification in South Africa. More than 80% of households have electricity compared to 58% in 1994. In rural areas, the major consuming market of layer and zinc chloride cells, 58% of households has electricity compared to only 16% in 1994.
2. The change in consumer preference to the superior alkaline batteries
3. Lower income availability for batteries as a result of alternative spending patterns (increased spending on gambling and cell phones)

However, the market has stabilized after 5 years of decline.

Ever Ready have 90% of the local market for zinc chloride batteries. **Table 30** indicates zinc usage rates for South Africa

Table 30. Zinc usage rates for South Africa

	1995		2000	
	Units (m)	**Zn tonnes**	**Units (m)**	**Zn tonnes**
Local market	220		120	2040
Market for Rounds	190		105	1785
Imports	59	1500	36	900
Imports Rounds ($ZnCl_2$ + alk)	55		33	
Imported $ZnCl_2$Rnds	30		7	150
Local $ZnCl_2$ supply	120	3000	73	1500
Local Layer stacks	30	700	15	350
Exports	13	300	5	100

The PE plant has secured orders for the supply of layer stacks to the UK. The layer stack plant has been in full production since August. This should have caused an increase in demand of around 300 tonnes per annum over 2000.

Clearly, to reduce unit costs volumes would have to return to old levels. Gillette Marketing is working on this issue. Indeed, markets have been opened in Africa where the brand has a strong name. However, inferior brand copies are being imported from China into certain countries such as Ethiopia.

The import and export statistics are shown in **Figure 21**.

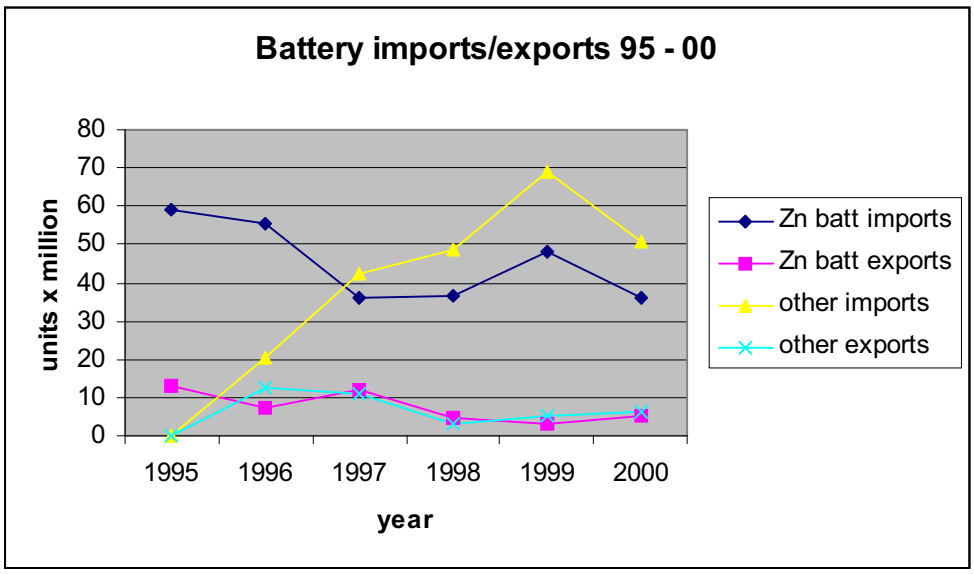


Figure 21. SA trade in primary cells.

About 25% of the zinc-chloride batteries are imported into South Africa. Unfortunately, many of these are substandard and an initiative is underway to curb this. The effects of the cell phone industry in the importation of lithium batteries is clearly shown. The market size for round cells is usually taken as 4 to 6 times the population of a country.

The majority of the world's battery manufacturers have sales representation in South Africa. Importation is via agents. The reason for no alternative manufacturer being present in South Africa is the small local market size and the fact that development of the alkaline battery was carried out overseas. Currently, there is an excess of capacity in alkaline battery production. Therefore, it is unlikely that a facility will be built in South Africa.

7.2.4 Opportunities

It is clear that the market for zinc-chloride batteries is restricted and declining. Capacity in alternative battery types is oversubscribed internationally. As a result, no major opportunity can be identified using existing technology in mass produced batteries. However, the PE plant has capacity (2 x 40 tonne furnaces and strip rolling

facilities). This capacity could be utilised for alternative products in the interim. In the long term, capacity utilisation needs to be maximised by Gillette.

Another comment worthy of note is the presence of Delta Electrical Industries in South Africa. The company is the world's largest producer of electrolytic manganese dioxide (EMD) used by the international dry cell battery manufacturers. Delta has two of the world's largest facilities – one in Nelspruit and one in Newcastle in Australia. As zinc powder is a large component of the dry cell battery industry dialogue with Delta could be advantageous for a supplier such as Zinchem. Thus, a total electrolyte package could be supplied locally. Longer term, this activity could result in local final product manufacture.

7.3 Chemicals

Information at a glance 2000

Employee numbers (97) **217 502 (Chemical industry total - Rubber 16 132, Fertilizer 4 495)**
Value (turnover, R) **R20bn+**
Zinc Consumption **12 500 tonnes**
Association/Industry Grouping
Chemical and Allied Industries' Association, South African Tyre Manufacturers Conference, Fertilizer Society of South Africa
Exports (Zn tonne equivalents) **1000**
Local Product sales (Zn tonne equivalents) **12 500**
Estimated imported product sales (Zn tonne equivalents) **500**
Opportunities for added zinc consumption **1000**

Statistics

	Employees	Zinc consumption	Exports (zinc tonnes)	Imports (zinc tonnes)
1995		**14 000**	**0***	**500**
2000		**12 500**	**1000**	**500**

*** based upon tyre figures only**

7.3.1 Respondents

The respondents to this section included the major suppliers of zinc chemical feedstock, the tyre & rubber manufacturers, the primary chemicals industry, the main paint manufacturers and key traders.

Industry players	Number of respondents
Oxide/Feedstock suppliers	2
Tyre/rubber producers	5
Primary chemicals	3
Paint manufacturers	2
Traders	4
Associations	4

.

7.3.2 Overview

South Africa's chemical industry is of substantial economic significance to the country, contributing around 5% to GDP and approximately 25% of its manufacturing sales. Products are divided into primary (feedstocks and commodity chemicals), secondary (intermediate chemicals) and tertiary (speciality chemicals and processed goods).

The primary and secondary sectors are dominated by Sasol (through Sasol Chemical Industries and Sasol Polymers), AECI and Dow Sentrachem. These companies have recently diversified and expanded their interests in tertiary products; especially those with export potential.

The industry has moved away from import substitution that had resulted in a proliferation of small uneconomic plants unable to compete on the international market. There has been major restructuring over the past 10 years and the dti with the Chemical and Allied Industries' Association (CAIA), seeks to promote the efficiency, productivity and competitiveness of the chemical and allied industries in South Africa. The industry carried out a cluster study to analyse competitiveness, but the study focus was on petrochemicals only. There is a feeling that government is reluctant to alter supply side measures to encourage investment for whatever reason. Notwithstanding this, there has been major restructuring over the past few years. The restructuring process has led to the introduction of joint ventures that could provide opportunities. Examples of achievement are –

- In 1999 AECI sold its 40% share in Sasol Polymers to Sasol and entered into a joint venture with PPG Industries of Pittsburgh to develop its Dulux technical paints business.
- The takeover of Sentrachem by Dow in 1997 has also precipitated a number of changes that include the purchase of Hoechst's share in Safripol. Sanachem has been restructured as Dow Agrosciences and is focusing strongly on the export market.
- Dow Sentrachem is also involved in a joint venture with Bayer called Chrome Chemicals. A state-of-the-art plant has been built near Newcastle to exploit South Africa's enormous chromite deposits by producing value-added chrome chemicals.

Tertiary (speciality) chemicals tend to be lower volume, higher value-added chemicals. Together with processed goods, they can be classified as the result of:

- bulk formulation, e.g. fertilizers, explosives, paints.
- fine formulation, e.g. mining and agro-chemicals, adhesives, additives, cleaning and paper chemicals.
- conversion and, fabrication e.g. plastics (packaging, piping), rubbers (tyres, hoses, etc), fibres (textiles, clothing).

There are a number of companies involved in local production or importation of speciality and performance chemicals. Included are Chemserve, Fine Chemicals Corp (S.A. Druggists), Noriscel, Henkel, Revertex, CH Chemicals and various companies in the Protea group including Chempro. There is an active trading sector comprising traders and agents who handle the importation and marketing of speciality and fine chemicals. Included are Saarchem, Protea, Crest Chemicals, Carst & Walker, Lewis & Everitt and T&C Chemicals.

Plastics and rubber, agricultural chemicals, fertilizers, paints, explosives and mining chemicals, dominate markets for chemicals in South Africa.

Industry Statistics

Table 31. Production of primary and secondary chemical products: 1996

SECTOR	SUB-SECTOR	PRODUCTION			
		MASS* (tons)	%	VALUE (Rm)	%
(a) Primary	Inorganics Organics	4 207 307 1 683 759	33 14	3 382 2 911	18 16
Total (a)		5 891 066	47	6 293	34
(b) Secondary	Inorganics Organics	4 993 716 1 610 037	40 13	5 072 6 864	28 38
Total (b)		6 603 753	53	11 936	77
TOTAL (a + b)		**12 494 819**		**18 229**	

* All figures exclude captive use of products

Table 32. Chemical imports and exports: 1994 – 1998

Imports	**Mass Tons**				
Category	**1994**	**1995**	**1996**	**1997**	**1998**
Primary Inorganic	538 642	808 036	1 367 219	1 547 110	1 511 377
Primary Organic	122 754	121 725	102 330	172 177	157 386
Secondary Inorganic	273 306	275 832	332 622	399 868	1 001 245
Secondary Organic	802 962	893 928	809 900	894 039	939 435
Total	**1 737 664**	**2 099 521**	**2 612 071**	**3 013 194**	**3 609 442**
Imports	**Value Rand Million**				
Category	**1994**	**1995**	**1996**	**1997**	**1998**
Primary Inorganic	429	756	1 329	1 708	1 872
Primary Organic	473	515	831	625	683
Secondary Inorganic	507	508	1 580	714	897
Secondary Organic	3 941	5 575	5 930	6 059	6 062
Total	**5 350**	**7 354**	**9 670**	**9 106**	**9 514**
Exports	**Mass Tons**				
Category	**1994**	**1995**	**1996**	**1997**	**1998**
Primary Inorganic	*Not Available*	1 253 218	1 021 701	1 320 761	1 190 156
Primary Organic		705 315	890 098	95 465	112 925
Secondary Inorganic		844 642	1 312 140	1 440 150	1 523 233
Secondary Organic		240 163	248 407	680 240	540 361
Total		**3 043 338**	**3 472 346**	**3 536 616**	**3 366 675**
Exports	**Value Rand Million**				
Category	**1994**	**1995**	**1996**	**1997**	**1998**
Primary Inorganic	*Not Available*	1 805	2 182	2 151	1 592
Primary Organic		1 057	1 449	289	356

Secondary Inorganic		880	1 367	1 531	1 732
Secondary Organic		817	901	1 706	1 940
Total		**4 559**	**5 899**	**5 677**	**5 620**

7.3.3 Zinc uses in the SA Chemicals Industry.

7.3.3.1 Statistics

Consumption patterns for zinc in the SA chemicals industry are shown in **Table 33**. Tonnage applications for zinc lie primarily in the rubber and agricultural industries. However, it is also used in the ceramic (used in glazing – this is estimated to be the second largest use of zinc oxide internationally), pharmaceutical (creams and nutrition additives) and the feed industries. Zinc is second only to iron as a trace element in humans.

Table 33. Zinc use in the SA chemicals industry

Sector	1995		2000	
	tonnes	Zn ≡ tonnes	tonnes	Zn ≡ tonnes
Rubber		3500	5000	4000
Agricultural chemicals (fertilizer, feed, etc)*	12 000	6000	12 000	6000
Paints	1100	1100	1000	1000
Mining Chemicals	3500	3500	1500	1500
TOTAL		**14 000**		**12 500**

***consumption rise should have been noticeable in 2001**

7.3.3.2 Rubber Industry

The major use of zinc in the SA Chemicals Industry is in rubber (tyres). Four major companies, Dunlop, Goodyear, Bridgestone and Continental dominate this industry. All the companies are active participants in the Motor Industry Development Programme. It is estimated that the current consumption of zinc oxide is some 5 000 tpa. At 80% zinc, this equates to 4 000 tpa of zinc.

Zinc oxide is used as an accelerator for the rubber vulcanisation (curing) process. Measurement of use is 5phr (parts per hundred of rubber). This equate to 4phr of zinc. As this is a volumetric calculation this becomes 1.5% by weight. However, in tyres zinc is used to slow rubber aging, as a reinforcing agent, a heat conductor and absorber of UV. As a result, the weight percentage added to rubber is close to 2%. About 26% of zinc oxide worldwide is used in tyres with another 12% going into other rubbers. Overall, in the tyre industry, consumption has fallen over the last 25 years. This is primarily due to the switch from cross-ply to radial tyres together with improved tyre life.

7.3.3.2.1 Statistics

Worldwide, estimates are that 26% of all zinc oxide available is used in tyres and 12% in other rubber products. Thus, almost 40% of zinc oxide use is in the rubber industry. Much of this is derived from recycled product. Rubber products are used chiefly in industrial applications ranging from hoses and conveyor belts to tyres. The industrial

product divisions of the major tyre producers supply industrial products. These divisions have not shown good financial returns for a number of years. Growth and opportunity is seen primarily in the tyre business.

World tyre production largely mirrors vehicle production. However, unit consumption of zinc oxide has declined due to the development of radial ply tyres and a reduction in tyre size mirroring the trend towards smaller cars. The commonly quoted tyre production consumption figure is 1 kg of zinc per car (**source ILZSG**). Total annual world production of vehicles is of the order of 35 million cars and 15 million commercial vehicles. This would equate roughly to a minimum consumption of 70 000 tpa of zinc. In South Africa, total vehicle production is of the order of 516 000 units which equates to an OEM market of at least 1 500 tonnes per annum of zinc consumption.

Table 34. Statistics on the SA tyre industry (tonnes of rubber) (Source SATMC, 2001).

	1995	2001
Total local market (tonnes)	160 000	160 000
Total imports (tonnes)	30 000	30 000
Total exports (tonnes)	0	45 000
Capacity utilisation	75%	75%
Zinc consumption (Zn≡)	3 500t	4 000t

7.3.3.2.2 Competition/Efficiency

Four major tyre manufacturers produce in South Africa – Bridgestone/Firestone, Continental, Dunlop and Goodyear. All four companies are part of global operations in terms of product supply. Dunlop has recently been delisted from the JSE after an MBO. With the exception of Dunlop, the tyre companies tend to be local in terms of product trade. Overall capacity utilisation is low within the industry (5 day week is the norm). However, initiatives are underway to improve capacity utilisation. Traditionally, focus has been on common sizes with specials being imported. Cost structures within the industry are similar. However, due to the global nature of the businesses, each player operates in different niche markets, e.g. continental has a niche focus on cross-ply and heavy truck tyres, Dunlop is focusing on earth mover tyres for exports, Bridgestone/Firestone only produces Firestone tyres.

Export of final product is complicated by packing density – only 10 tonnes can be packed into a 20-foot (20 tonne) container. Local competitiveness is impeded to some extent due to the small run size of tyre units.

Some 60 – 70% of raw material (rubber) is imported. The importation cost of raw materials does impede overall expansion. However, a concerted local supply programme could redress this position. For information raw material component is listed in **Table 35**.

Table 35. Raw material make-up of tyres (Source Bridgestone SA).

Synthetic Rubber	20%
Natural Rubber*	20%
Carbon Black	15%
Steel Cord*	15%
Nylon Rayon	15%
Bead Wire*	5%
Other chemicals (incl. zinc oxide)	10%

*imported

7.3.3.2.3 Markets

OEM supply is the major business of all the producers. The MIDP programme has the advantage that tyres carry 100% credit value. This has assisted the export programme. In addition increased vehicle exports have resulted in a greater product take-off as exports of finished vehicles increase.

All the four producers have retail outlets –

- Bridgestone/Firestone – Maxiprest, Super Quick
- Continental - Conti
- Goodyear - High Q
- Dunlop – Dunlop Accredited Dealers

This system, through efficient franchising is marginalizing the independent retailers, which in turn is assisting local versus imported sales. However, Dunlop sells some 85% of its local supply through independent retailers. High performance tyres and other specials are generally imported (either by the producers or other manufacturers such as Michelin. Pirelli and Yokahama).

Tyre manufacturers have been able to grow through exports (now 35% of production but up to 50% for some manufacturers). However, some manufacturers are restricted to regions by their overseas owners. The local market has shown no growth due to the active trade in second hand and retread markets (55% in the truck market, 5% in the passenger car market). The new proposed Second Hand Goods Act will address this unfortunate practice, together with product disposal.

There has been a move to improve plant utility throughout the industry with more truck and other heavy tyres produced locally. This should result in a 10% growth per year for the foreseeable future.

7.3.3.2.4 Opportunities

The opportunities offered to the zinc industry are fourfold -

1. By leveraging the import credit programme with vehicle manufacturers advantage of the MIDP could be used to increase product take-off by moving into a manufacturers global sourcing programme.
2. Global supply of oxide (should input sourcing be possible) could be considered by oxide suppliers.

3. New technology is being developed – high surface area activated zinc oxide. Currently at least one tyre manufacturer is moving towards this product (sourced from the UK). This opportunity needs further exploration.
4. The independent tyre manufacturer is active in the search for a market partner to utilise all existing capacity and possibly develop new capacity.

7.3.3.3 Agricultural Chemicals

7.3.3.3.1 Statistics

World fertilizer consumption has been growing at 3 to 4% per annum since 1992. South Africa is one of the larger fertiliser producing countries in Africa with a full range of fertiliser products being manufactured and marketed. These include dry, liquid and speciality fertilisers, and encompass nitrogenous, phosphoric, mixed and other forms. As can be seen in the pie chart of South African production, nitrogenous fertilisers represent the largest demand sector, which account for nearly 40% of total production (see **Figure 22**). Mixed (NPK) fertilisers account for a third of production and phosphoric fertilisers make up 17% of output.

Terminology in the industry is N, P, K depending upon whether the product is nitrogen rich, phosphate rich (sold as mono-ammonium phosphate – MAP) or potassium rich (nitrogen-phosphate-potassium – NPK).

The majority of South African soils are zinc deficient. The critical zinc requirement is 2 ppm and most soils are below this figure. As a result zinc has to be added to final blends. All phosphate-based products contain zinc. Liquid blends contain 0.25% as $ZnSO_4$; solid blends contain 0.5% as Zn ash (milled). MAP and NPK account for 60% of the fertilizer market.

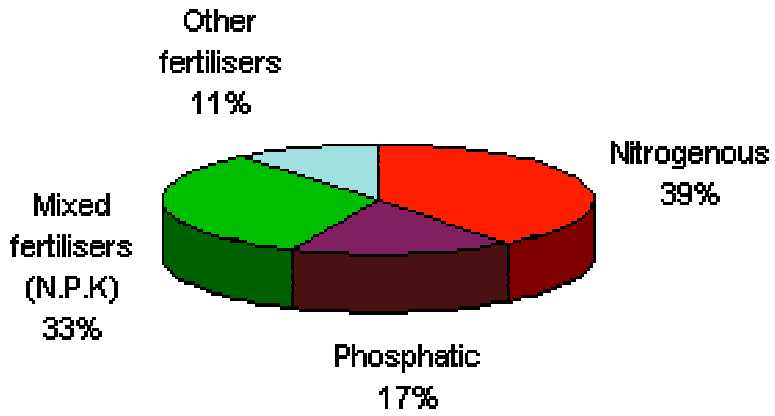


Figure 22. South African fertilizer production (Source CAIA).

The local market has undergone structural changes over the past few years, both in terms of supply and consumption patterns.

Table 36. South African fertilizer consumption ('000 tonnes) and percentage plant food concentration (Source FSSA, 2000).

	1994	1995	1996	1997	1998	1999	2000
N	375	371	415	407	416	413	429
P	108	106	112	102	95	99	82
K	108	112	119	114	132	113	111
Total	591	589	646	623	643	625	622
Physical	2000.2	1998.8	2170.8	2088.4	2054.2	2051.5	2008.1
Av. plantfood concentration	29.5%	29.4%	29.7%	29.4%	30.5%		

Consumption of fertilizer peaked at 3.3MT in 1981 and fell steadily to an equilibrium level of 2.0MT in 1987. International competition and an inability to dispose of surpluses profitably during the sanctions era lead to the decline.

Table 37. Statistics on the SA fertilizer industry (Source FSSA, 2000).

	1995	2000
Total market tonnes	2.0 million tonnes	2.2 million tonnes
Capacity utilisation[1]	90%	80%
Zinc consumption (Zn≡)[2]	6 000t	6 000t
Imports	24 000 tonnes[3]	70 000 tonnes[4]
Exports	508 000 tonnes[3]	700 000 tonnes[5]

1. It is considered that Sasol are producing to capacity. Kynoch produce to capacity but have old plant. Omnia have invested in new capex (R300m) and are able to run below capacity when demand is low.
2. Check = 2.0m x 60% x 0.5% x = 6 000t
3. 1997 figures
4. estimate
5. 1999 figures

7.3.3.3.2 Competition/Efficiency

Agricultural chemicals are dominated by the fertilizer industry. The major producers are Omnia, Kynoch, Indian Ocean Fertilizers and Sasol Agri. Sasol and Omnia are about the same size in fertilizers with Kynoch (now 100% owned by Hydro of Norway) being the biggest. Indian Ocean Fertilizers (now owned by Foskor) focuses on exports. The other producers export opportunistically depending upon the ammonia/urea cost ratio. Dow Agrichemicals provide chiefly pesticides.

The fertilizer industry is remarkably competitive considering it suffers from chronic under-utilisation of capacity and the economies of scale enjoyed by global players. Fertilizer consumption in South Africa accounts for 10% of total agricultural spending. Imports (of final product) have primarily been on an opportunistic basis when the international price proves competitive in terms of local pricing structures. Notwithstanding this, world trade in fertilizers has increased greatly over the past few years.

The nitrogen supply to the industry is split into Urea and LAN (Limestone mixed with Ammonium Nitrate – 28% nitrogen). Urea was supplied by AECI (together with a

supply of LAN) until the AECI plant closure in 2001. This removed 400 000 tonnes of ammonia capacity per annum requiring some importation. Both Omnia and Sasol produce LAN.

Phalaborwa supplies phosphate (from rock) for Omnia and, Sasol and Kynoch via Fedmis (a 50:50 JV between Sasol Agri and Kynoch (although Kynoch withdrew from the JV last year after being 100% acquired by Hydro). Fedmis produces phosphoric acid and some bulk products such as MAP. Kynoch still uses its phosphoric acid facility to supply phosphate. Foskor dominates the phosphate industry.

Sasol supplies ammonia to the industry. The dependency on Sasol by the other players does create some tension within the industry. The nitrogen requirement of the industry is some 460 000 tpy (as nitrogen). Currently at least 150 000 tonnes is imported annually (as nitrogen).

Potassium (as chloride, sulphate or nitrate) is imported from various countries.

The fertilizer industry had administered prices abolished in 1984. Since the deregulation of the industry in 1992 (the removal of import tariffs and the disappearance of the strategic grain reserve), there has been no real stockpiling as in the agricultural market of the past. The market now operates a “Just In Time” system.

The fertilizer industry operates via two industry associations. The Chemical and Allied Industries Association (CAIA) is primarily responsible for liaison with government and acts as an umbrella organisation for the whole chemicals industry. The Fertilizer Society of South Africa behaves as a technical forum for the industry.

Significant importation of component product is required (chiefly urea after the demise of the AECI plant) with ammonia produced by Sasol. Therefore two factors affect the profitability of the industry – the ratio of costings ammonia/urea and transport. When the ratio is high the local fertilizer companies become very buoyant and visa versa. This effect particularly affects exports. Transport (rail) infrastructure appears to be a factor in this business as Spoornet’s performance can create supply difficulties. Clearly, Rand performance also impacts upon profitability as much input product is locally sourced.

Southern African soils have a zinc deficiency requiring zinc as an addition. Zinc is added as zinc oxide (primarily in the form of milled ash). Supply into this industry is totally price dependent (i.e. almost any quality of zinc ash will do). As a result, a number of galvanizers sell ash directly into this market with the fertilizer producers having their own granulation facilities.

7.3.3.3.3 Markets

The South African agricultural industry has grown into an efficient and sophisticated provider of food and foreign exchange. All this despite an erratic and unreliable weather pattern. All the local fertilizer producers serve the local market with exports going to sub-Saharan Africa and Indian Ocean islands. Local supply is via Co-ops and directly. The customer base is sophisticated. A survey in the mid 1990s by South

Africa Grain (formerly the Grain Board) showed that the computer literacy of farmers was over 46%. This compares very favourably against the anticipated 15% and has no doubt grown higher in recent years. The farming community is getting younger and a high proportion of them are university graduates.

As the agricultural market has moved towards a deregulated environment and the cost of phosphate (P) has increased at a faster rate than potash (K) due to world prices. Local fertilizer prices are based upon import parity. This has an implication for zinc use as zinc consumption tends to be tied to phosphate consumption. However, it is accepted that zinc behaves as a heavy metal in the environment and therefore, whilst essential to growth, many local soils may have reached an optimum level. Notwithstanding this, in all likelihood nutrient depletion in soil is likely to promote a move back to the phosphate systems. The ideal is to use phosphate fertilizers (containing zinc) for planting with nitrogen added later to encourage further plant growth.

Exports focus on intermediaries, e.g. MAP and bulk blends. These do not have zinc added, this being added by the final blender where necessary. In the local market Sasol in particular are moving away from granulated chemicals to bulk blends (this will be 90% of their product line in the next 2 – 3 years). This will also assist in their export drive. Therefore, for their local demand, Sasol's zinc consumption alone will grow by 10% per year for the next five years (1 – 3mm diameter zinc granules).

7.3.3.3.4 Opportunities

Maintaining and restoring soil fertility in Africa is a global concern as nutrient removal (N, P and K) exceeds replenishment by a factor of 3 to 4. By example, average fertilizer consumption in sub-Saharan Africa is about 8 kg of nutrient/ha compared to 174 kg/ha in East Asia and 60 kg/ha in Latin America. For sustainable development this issue must be addressed. The food imbalance in Africa is determined as purely a result of agricultural mismanagement.

The local fertilizer industry views itself under threat from cheap imports produced in countries where governance principles are not applied. However, exports appear to remain constant at 10% of local supply – so perhaps the threat is over-stated. In addition, the local industry has offered a high level of technical support to all participants in the agricultural industry. There is little doubt that this counters the import threat and has formed a successful synergy with government in areas of research and development. The greatest threat is seen as the lowering of these technical support programmes by the industry as a response to remain competitive against imports and government as it trims budgets.

The nutrient depletion noted above means that insufficient lime (as LAN) has been added which will result in soil acidification. It is therefore likely that as world prices of grain and maize rise (or the Rand depreciates as has happened recently) and farm revenues improve there will be an increase in LAN and MAP resulting in an increase in zinc consumption.

Some industry players view the addition of zinc essential to the extent that they would like to move towards 0.75% additions. However, it is felt that unless the whole

industry moves together, the first to change would be at a price/cost disadvantage. This situation seems to mirror the world position with Cargill (a large US supplier of fertilizer and seed) wanting to supply their market with zinc enriched MAP and seed.

Each individual company has a distinct policy in terms of market positioning – bulk blend supplier versus speciality fertilizer supplier. The latter specifically provides opportunities for increased zinc addition to final product. In addition, citrus and table grape production in South Africa is increasing rapidly. Combined with other forms of intensive crop farming, these developments provide for opportunities to increase fertilizer zinc proportions. It is recommended that promotion support be given to the industry generally through the SA Fertilizer Society and specifically to individual company promotion programmes. This should form part of the promotion programme focusing upon the essentiality of zinc.

Clearly, this provides an opportunity for growth with an intervention targeting market pull. This represents a 50% market increase to 9 000 tpa. Combined with product changes (discussed above), this figure should be achievable.

7.3.3.4 Paints

The industrial paints sector has undergone major changes over the past couple of years with local production capacity being reduced. Local production is now limited to Sigma (AECI – PPG joint venture) and Stoncor (owned by Stoncor, USA). Local consumption is very project dependant. Whilst opportunities for zinc powder supply to the overseas manufacturers could be an opportunity, pricing levels would have to accommodate this.

7.3.3.5 Mining Chemicals

Mining chemicals have seen a significant decline over a 5-year period as gold recovery technology has changed from the zinc precipitation process to Carbon-in-Pulp (CIP) and Carbon-in-Leach (CIL). This trend is unlikely to change and from a zinc consumption perspective it should be viewed as a market in decline.

7.4 Brass Industry

Information at a glance 2000

Employee numbers **1290**
Value (turnover, R)
Primary Zinc Consumption **7 000 tonnes**
Association/Industry Grouping
Non Ferrous Metal Industries Association
Exports (Zn tonne equivalents) **8 900 tonnes**
Local Product sales (Zn tonne equivalents) **1500 tonnes**
Estimated imports of brass (Zn tonne equivalents) **400 tonnes**

Statistics

	Employees[1]	Zinc consumption	Exports[2] (zinc tonnes)	Imports[2] (zinc tonnes)
1995	**(1992) 3200**	**10 000**	**2 800**	**450**
2000	**(2001) 1290**	**7 000**	**8 900**	**400**

1. **These figures are the totals for the members of the Non-Ferrous Metal Industries Association.**
2. **Semis only (no scrap). Clearly much of the export product is from scrap**

7.4.1 Respondents

The respondents to this section included the major suppliers of brass extrusions, ingot & billet the zinc suppliers, representatives from the plumbing industry, the electrical industry, the security industry (locks, door handles, etc) and the scrap/recycling industry. The contribution of the Copper Development Association, especially from Mr Alistair Peterkin is gratefully acknowledged. Other input was received from Mr Dennis Booth acting upon the behalf of the NFMIA, Mr Michael MacDonald of SEIFSA and Bill Randell of the Institute of Plumbers (IOPSA).

Industry players	Number of respondents
Brass suppliers	3
Plumbing (IOPSA, traders, mfrs)	5
Electrical	2
Security	1
Scrap/recyclers	3

7.4.2 Industry Description

The main primary brass products are ingot, billet and extrusions. These products service the plumbing, electrical and lock industries

The South African brass supply industry is dominated by two major players, – Copalcor and Non Ferrous Metals (NFM). Essentially both companies are privately owned. Both of these companies have experienced difficulties over the past few years due to structural changes within the market. Some customers have complained that there is collusion in pricing. However, this is in all probability more a reflection of LME based input pricing.

Copalcor is divided into two operating companies, Brass Extruders SA (BESA) and Copalcor Rolled Metals (CRM). Some 15 years ago, sales for BESA were 30 000 tpa. This has reduced to less than 10 000 tpa. The company is working at 40% capacity with 10 – 15% of production being exported. Essentially, the ingot export business has dried up. The major reason for the decline in business was laid at the door of reduced import tariffs and the lack of availability of secondary material through the exporting of scrap supply. Presumably, in the past, exporting of ingot was carried out on a marginal cost basis. Thus, the decline of exports follows the loss of local market share.

Non Ferrous Metals is heavily export orientated amounting to 60% of total production (ingot and extrusions) when the price of scrap is low enough to permit their entry into the market. Their production of extrusions is estimated at 20 000 tpa. NFM import rolled products, primarily those not within the Copalcor standard range (typically up to 600mm wide). Imports also include mirror and textured sheet.

Overall, the brass semis industry is export orientated. However, as mentioned below, the industry is dependant upon scrap. It is estimated that only 50% of the zinc supply is virgin zinc. Therefore, taking a zinc figure of 40% in brass, zinc tonnes are only 20% of the trade figures supplied below. Only major tariff descriptions are presented due to the mis-allocation of specific entries.

Tariff codes for brass are:

74072xxx – brass extrusions (bar, rod, hollows)
7408xxxx – wire products
74032xxx – unwrought brass
7409xxxx – rolled products

Trade in brass over the past ten years is shown in **Figures 23, 24, 25 and 26.**

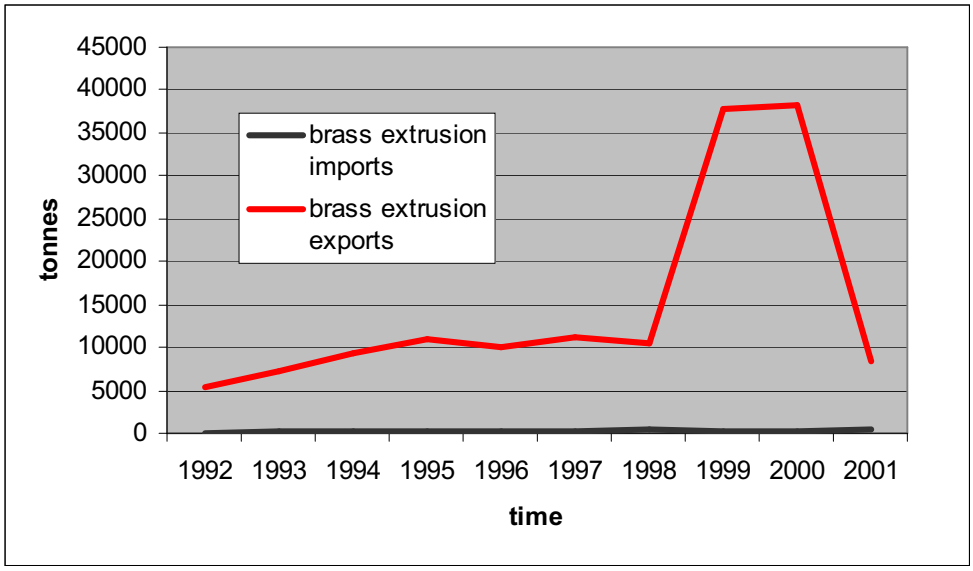


Figure 23. Trade in the brass extrusion industry 1992 – 2001 (source SARS, CDA).

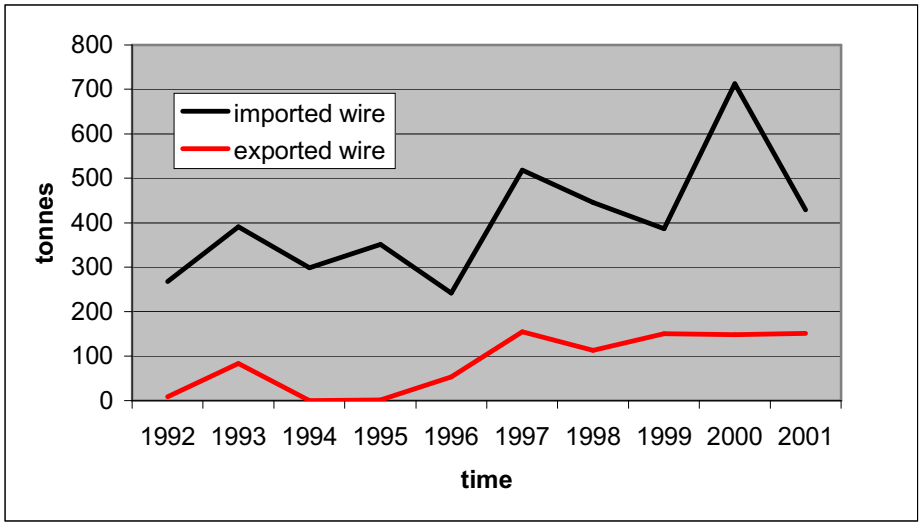


Figure 24. Trade in brass wire 1992 – 2001 (source SARS, CDA).

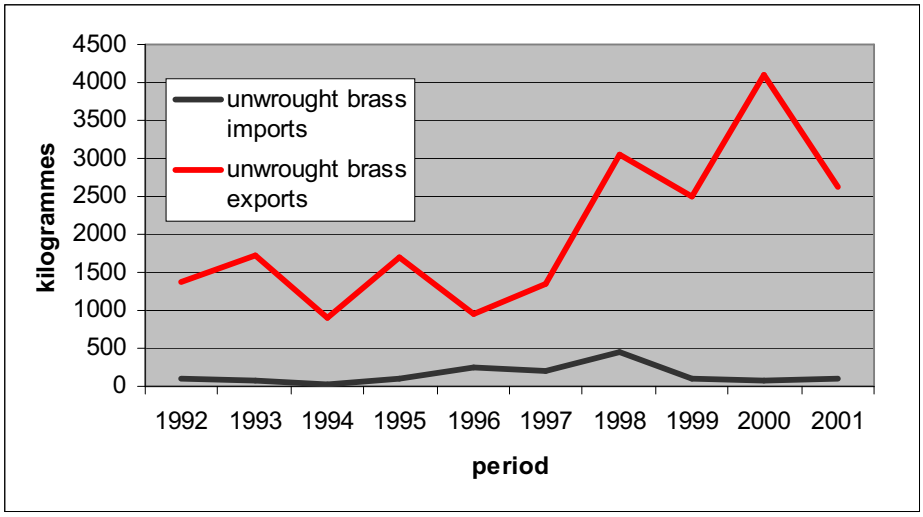


Figure 25. Trade in unwrought brass 1992 – 2001 (source SARS, CDA).

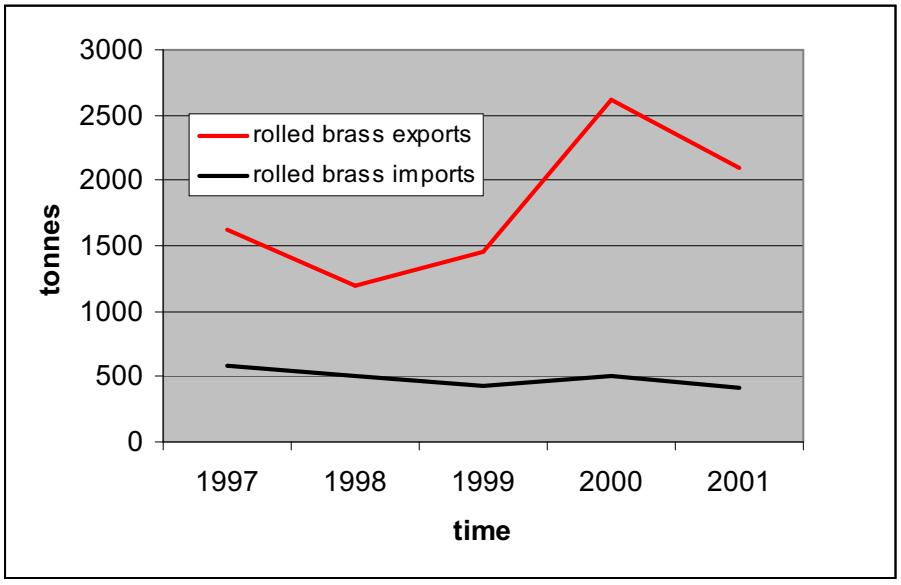


Figure 26. Trade in rolled brass products 1997 – 2001 (source, CDA).

Locally, brass pricing over the past years has not followed the LMB swarf price, whereas, particularly in Europe and the Far East this has been the case. Therefore, competitive prices have not been available to end-users. The reasons behind this are due to the exporting of scrap at premium prices (see discussion below).

Other industry companies consuming zinc are PMP Rolled Products and Continuous Cast Products.

PMP's primary business is the production of small and medium calibre ammunition. The plant produces strip (15 tonne heats) some of which is sold locally although this market has declined significantly. Some 300 tpm was sold up to 3 years ago. Discs are cut, cups then produced as a product and this converted to final ammunition. Costing strip production, 30/40% is conversion, the balance being material. 30% of this is zinc (all purchased via Zincor). In cup production the balance of material costs to conversion costs is closer to 50/50. PMP had a copper cropping plant to treat scrap but they are now out of this business.

The current brass plant (including the melting facility) was constructed in 1979. PMP supplies the local market (strip, etc.) via Wieland. Wieland has re-rolling and slitting facilities. They also carry out some importing and carry out some value adding operations such as integral finning of tube.

Alloy use by PMP is 90/10 (copper/zinc) for the bullets (90% of material usage) and 70/30 for the cases. Strip is exported to the Far East (65/35 and 97/3). Some 60 – 70% of product is exported (with over 90% of the small arms ammunition being exported). The overall increase in rolled exports is shown in **Figure 26**.

PMP has recently increased its export operation. It sells 20 – 30 million Rands worth of ammunition per year to the USA and is one of the largest suppliers of hunting ammunition in the world. In September 2001 PMP signed a multi-million Rand contract with RO Defence (a unit of BAe Systems). The contract is a 5-year rolling contract and is part of the arms offset deal under the Industrial participation Scheme. The contract is for the supply of brass cups and discs. Zinc off-take from September onwards should reflect this improvement in trading position.

PMP still has capacity but most of this is now arising from de-bottlenecking.

There are also a myriad of foundries making and exporting ingot. These include Active Alloys and SA Metal and Machining in Cape Town.

The Non-Ferrous Metals Industry Association (NFMIA) administered by SEIFSA represents the aluminium and brass industries. The following relevant (zinc consuming) companies are members of this Association.

Brass Extruders S A	**PO Box 14382, Wadeville, 1422**
Castle Lead Works (Tvl) (Pty) Limited	**PO Box 3472, Kenmare, 1745**
Copalcor Rolled Metals	**Pr Bag X 030, Wadeville, 1422**
Fry's Metals (Pty) Limited	**PO Box 519, Germiston, 1400**
Non-Ferrous Metal Works (SA) (Pty) Limited	**PO Box 25, Durban, 4000**
Non-Ferrous Metal Works (SA) (Pty) Limited	**PO Box 40382, Cleveland, 2022**

The Association represents 80% of the available non-ferrous metal capacity in South Africa. There has been a decline in employment by the industry from 3200 employees in 1992 to 1290 in 2001.

7.4.3 End Users

The market for brass and related copper products has declined markedly over the past 20 years. In the past there were major markets in the plumbing (see below), railway, defence, mining and electricity distribution sectors. Infrastructure build in these sectors has declined markedly and combined with reduced defence expenditure demand on Brass Extruders and NFM has been marked.

Final users are primarily in the plumbing, electrical, security (locks, etc) and general hardware.

7.4.3.1 Plumbing

Cobra Watertech are the single largest player in this market. Another player is Exipro (formally Probrass and about 10% if the size of Cobra). Cobra's consumption of DZR brass (copper, zinc 36, lead 2) has declined from 11 000 tonnes in 1984 to 5 500 tonnes in 2001. Products are produced via the gravity and died casting routes. All ingot supply is now produced from swarf, with only rod purchased from Copalcor. The main reason for this is related to the decline in R80 000+ house market as shown below-

Investment in residential housing 1960 to present

	1960	1984	1987	2001
Investment	R4bn	R14bn	R8bn	R8bn
Housing units		2000pm		1000pm

The low cost housing market does not consume the high value products. Cobra has a high focus on exports. As an example, the exports to the West Indies are 50% of that sold to the old Boumat Group prior to its demise. Cobra, with Viro, tried to form a "Cluster" through the dti as the Brass Users Group. Unfortunately, at the time the CDA was trying to establish an overall Copper Cluster. This divergence resulted in neither initiative being successful. This was not successful and Cobra is critical of the government's moves since 1994. Particular issues are the rapid reduction in tariff barriers, discrepancies in the tariff rates; few investment incentives and governments focus on the Porter productivity model (defined as the value of output produced by a unit of labour or capital – *Porter, M. Competitive Advantage of Nations 1990*). Cobra sees no improvement in the local economy and is focusing on exports and the search for an overseas partner to enable plant capacity utilisation.

This industry is highly competitive as far as the retail market is concerned. In the design article market (taps, etc.) there has been a major marketing campaign by overseas suppliers (primarily German and Italian). In the valve and meter market a number of issues have reduced local brass product consumption. The water meter

market in South Africa is moving rapidly to plastic as a result of theft. Also, strange marketing tactics such as the provision, free, of some 100 000 plastic meters by China has eroded local plastic production. The valve market is highly competitive with products arriving from India and the Far East. There are numerous questions regarding the quality of some of these imports. However, JASWIC (Joint Acceptance Scheme for Water Installation Components) acceptance should ensure that quality regulations are met. In addition, the Department of Water Affairs is attempting to enforce a National Compulsory Water Specification controlling imports. However, the capacity to enforce such a scheme is easily questioned.

Tariff codes for the plumbing industry are –

74122xxx – plumbing fittings
8481xxxx – plumbing engineering products

The trade figures for plumbing products are shown in **Figures 27 and 28.**

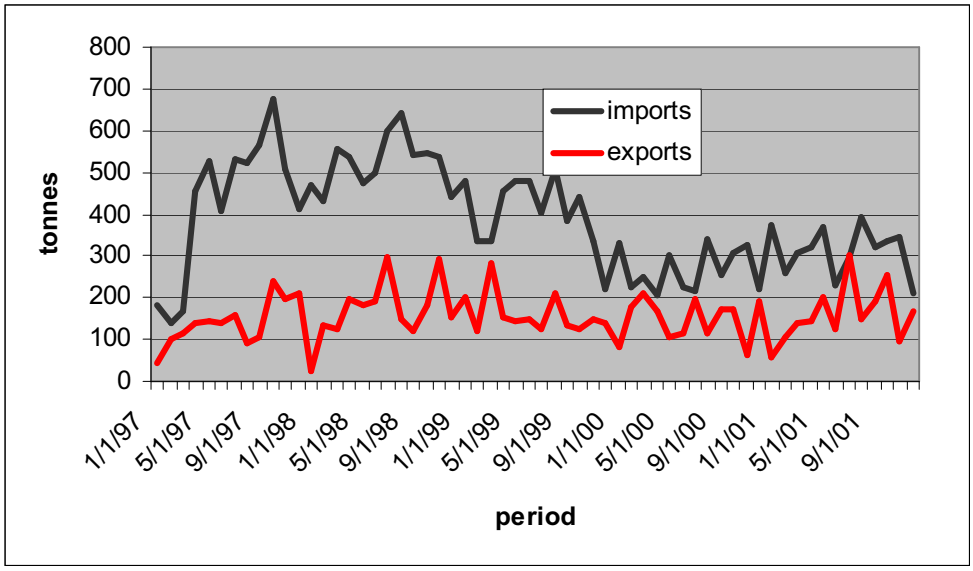


Figure 27. Trade of plumbing engineering products 1997 – 2001 (source CDA).

Overall, exports appear to be constant, the fall in imports recently being due to the depressed building market. It is unfortunate that the largest contributors to the above figures are the tariff codes "other". This is indicative of the mis-description of goods by some importers.

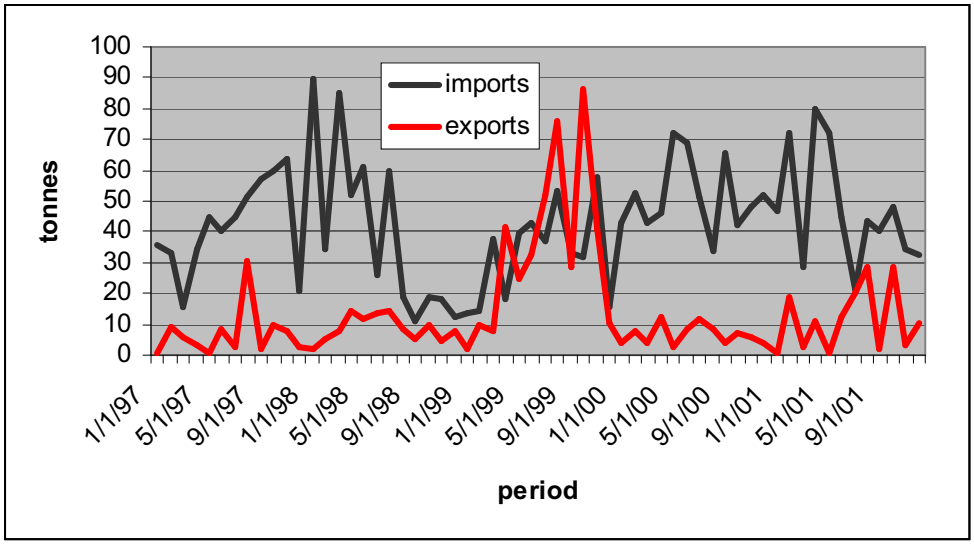


Figure 28. Trade of plumbing fittings 1997 – 2001 (source CDA).

Despite a peak in 1999/early 2000 exports have been relatively constant. However, the imports exceed imports. Notwithstanding these comments, overall, the trade tonnages are small.

7.4.3.2 Electrical

Most of the consumption recorded here is in the white goods market. The major users of brass and copper alloys in this market sector are Crabtree, Lumex/Clipsal and Switchking (now Switchboard Utilities). A significant degree of consolidation has occurred in the industry since 1994, especially within the Crabtree group. Clipsal is Australian owned and is active in the export market. Other users are appliance manufacturers such as Nu-World, Amalgamated Appliances, etc. To some degree, electrical appliance use is limited due to the unique electrical services regime in South Africa (round pin design).

Unfortunately, although co-operative, sales into this sector was primarily reported by the accounts departments in Rands. As a result only estimates of usage rates can be made. These are shown in **Table 38**. Major use is of extrusions and rolled products.

Table 38. Estimated consumption of brass by the electrical market.

Year	1995	2000	2001	2002
Brass tonnes	2000	620	825	778 [1]
Zinc tonnes[2]	900	280	370	350

1. Zinc use is based upon 45% (40% into brass + 5% melt loss).
2. Could be due to some de-stocking.

The drop in consumption since 1995 is almost all attributed to industry consolidation to counter imports and the rise in imports, i.e. the consolidation has only been partially successful.

7.4.3.3 Security

This industry uses zinc and brass, with the primary zinc usage being in die-casting. Therefore, the description of this industry is covered in the Die-Casting industry report (**Section 6.5**).

7.4.3.4 General Engineering

This area includes hardware (door handles, etc), fire protection (sprinkler systems). As with zinc die casting, the industry is divided into specific product companies (such as Pressure Die Castings/Hardware Assemblies (PDC), Halstead, Dielor and Trifon in the brass door handle business) and numerous small players providing a range of products from hardware to marine ancillaries. In the brass die casting industry there has been a view that per capita production in South Africa should be the highest in the world. Competition is fierce with the main markets being the building and construction sector locally. Exports are to direct customers and via agents depending upon the location of the markets served.

The South African brass die casting market is already working together (Cobra, PDC, Halstead with Bohler and Uddeholm who supply equipment) with the dti on a project to develop methods to extend die life.

Other major markets for copper alloys are the auto radiator and air-conditioning markets. In the air-conditioning market there is a move towards aluminium finning on copper tube. In the auto radiator industry, weight saving has resulted in a move towards aluminium for both the tube and fins. There is an initiative by the International Copper Association to address this issue through the introduction of the Cupro Braze radiator. Locally, Behr are now the largest auto radiator producer, having bought Silverton Engineering. Behr, having closed a plant in Spain, is concentrating production of copper based radiators in South Africa. This has resulted in increased raw material take-off locally. Behr are participants in the MIDP.

7.4.4 Scrap Issues

The brass industry utilises scrap widely. Indeed discussions revealed that the various industry players view their future as tied up with the availability of secondary recovered material. It is considered that the brass industry uses 50% of primary zinc (which includes virgin and green zinc) in its operations, the balance being from in-house recycling or scrap purchases. As a rule of thumb, primary zinc consumption in the brass industry is 50% of the zinc used and this total comprises 40% of the brass tonnes. Typically, there is a 10% melt loss in brass production with 80% of this being zinc. This flue dust is recycled. In extrusions 40 – 60% of the material is used, the balance being recycled. In the production of brass rod all the material is used.

Scrap plays an important role in the brass industry. Export of scrap arisings is seen by many as a route of obtaining hard currency. As a result there is a shortage of scrap for conversion to ingot locally. In addition, local quality brass ingot production is now lower than in the past due to lower demand. There is, therefore, a lower availability of high-grade scrap for local high-grade ingot production. There is, however, an excess of availability of low-grade scrap – much of this from non-standard sources.

Conversion of this to low-grade ingot for export only is not viable with the relatively high local price of this scrap. It is, therefore, exported as scrap without conversion to specification ingot (and the concomitant consumption of local zinc). As shown below, the importation of brass scrap is not viable. Prior to 1994, a preference export duty system was in place whereby supply to a local ingot manufacturer attracted a rebate of 15% against the potential export price. This clearly favoured local value adding through the production of specification ingot even if for eventual export. However, the system did permit inefficiencies to persist in the production of brass semis. The trade resulting from the removal of this incentive is clearly shown in **Figure 13**. Clearly, replacement of the preference system by an alternative system should have occurred. Assuming that some 10% of the copper trade is actually zinc, then the potential recyclable zinc scrap leaving the country is 10 000 tonnes per year. This directly impacts upon the competitiveness of the brass and die-casting industries.

The situation has been exacerbated by the handling of scrap by the big users (Telkom, Eskom, etc). These utilities run long-term scrap contract with an individual company to allow easy identification of other (stolen, etc.) scrap arising at other scrap yards. The contract with these scrap companies often includes the requirement that the scrap is exported, again to minimise value of unauthorised scrap.

Other anomalies, which compound the issue, are the disparity in tariff rates. For example, imported semis, such as rod, carry duty as do many final products (such as valves and plumbing fittings). However, categories such as parts and many "other" categories carry little or no duty. For instance, in tariff number 8481, all products used to be listed individually. Now there are only four categories. Of the four, three carry duties ranging from 10 to 15%. The category "other" carries a duty of 0%. These anomalies allow misrepresentation by unscrupulous importers.

7.4.5 Opportunities

The brass industry is clearly divided into the primary converters and the final product producers. The scrap issue is affecting the competitiveness of the whole industry. To move forward, the brass component of the NFMIA should be viewed as a cluster and encouraged to export successfully and thus compete in the local market. There are similarities within the group of value adders and the zinc die casting group. This will be discussed in the main report.

Industry plant utilisation is of the order of 50-60%. Therefore, just enabling full utilisation would generate some 30 000 tonnes of brass or 10 000 tonnes of zinc consumption. Capacity is available. It is recommended that the following actions be taken to assist the industry.

1. Press government to bring tin, aluminium and zinc into the Second hand Goods Act. Whether the effects will be as marked as the industry players feel is only part of the story. If successful, the Initiative will be able to work well with the group to address the other issues.
2. Form a Joint Action Group combining the brass users; such as Cobra, and the zinc die casters to determine a strategy forward. Issues for discussion should include requirements from government (export incentives, depreciation allowances, overseas stocking, scrap tariffs, customs

education, etc), opportunities, actions and measurables. Whilst every player may have their own agenda, it is clear that a common approach will be possible. This comment is reinforced by the co-operative projects currently being undertaken in the brass industry and the IZA/ILZRO information available for the die-casters. Thus, technology transfer may become a cornerstone of the activity in this area. Should there be no clarity from the JAG activity should be on an ongoing and not a priority project basis.

7.5 Die-Casting Industry.

Information at a glance 2000

Employee numbers (1999)
Value (turnover, R)
Zinc Consumption 8700 tonnes
Association/Industry Grouping
SAIF, NAACAM, AFSA
Exports (Zn tonne equivalents) 4000
Local Product sales (Zn tonne equivalents) 7000*
Estimated imported product sales (Zn tonne equivalents) 300
Opportunities for added zinc consumption 3000tpa

Statistics

	Employees	Zinc consumption	Exports (zinc tonnes)	Imports (zinc tonnes)
1995		**10 500**	**200**	**150**
2000		**8700***	**4 000**	**300**

*** It is estimated that less than 50% of this allocation goes into diecasting. The remainder enters the anode, wire, sheet, plate & rod markets**

7.5.1 Respondents

The respondents to this section included the major suppliers of alloys the main zinc alloy die casters and some key customers. In addition, the input of various members of the SAIF is gratefully acknowledged together with the Automotive Industry Development Centre (CSIR), NAACAM, BMW, Ford and dti representatives from the MIDP.

Industry players	Number of respondents
Zinc suppliers	3
Die-casters	6
Association representatives	3
Direct users	4

7.5.2 Overview/Competition/Efficiency

South Africa's die casting industry is dispersed with numerous small players (6 to 160 employees) with zinc tonnage outputs ranging from 200 to around 1000 tpa zinc alloys.

Some years ago, there was a Die Casters Association formed by the main industry players at the time –

- NF Die-Casters (now gone)
- Solid Hardware (now part of Assa Abloy)
- Safa
- Zealous
- Josiah Parks (now Assa Abloy)
- Natal Die-Casters
- Pretoria Precision (eventually taken into Zealous)

It is difficult to define the value of this industry although it is estimated that zinc consumption is of the order of 8 700 tpa. In 2001 there were 71 Non-Ferrous Foundries listed by the SA Institute of Foundrymen (SAIF). Methods of reporting changed but in 1999 the SAIF listed 17 Die-Casters and 6 companies specializing in zinc alloys. The latter list provided the focus for the industry survey.

Industry cohesiveness is weak with numerous companies being members of SAIF and NAACAM but with few cross memberships. As a result the industry has little group focus with a wide product mix and most companies relying upon jobbing operations to serve local (geographic) markets. The industry consumes almost half of the zinc consumed 10 years ago. Investment in equipment has been almost non-existent. The major developments in die casting technology were in the 1990s. However, much of the installed capacity locally predates this period (often by 20+ years). There appears to be a shortage of skills within this industry, in particular toolmakers. Therefore, the small companies often experience die design problems. The larger companies have retained these skills as a priority despite a reduction in demand.

The local availability of scrap impacts upon the industry, with there being a shortage of quality scrap. As discussed previously (**Section 4.3**), the consolidation and movement of scrap overseas is clearly a sound business when compared to the small unit consumption figures for most of the die casters. A study is currently being carried out by the dti and the aluminium industry to determine the viability of value adding in South Africa. A technology transfer system has been developed at the CSIR and the University of Natal to address the industry limitations due to equipment age (systems such as retrofits, etc). However, the limitation of material supply requires more study. Value adding in the aluminium die casting business is of the order of 4 to 11 times the ingot value. Whilst this may be of value to South Africa Ltd maximising financial shareholder value of Billiton (virgin supply) and the Reclaim Group (recycled supply) appears to prefer no value adding.

Not withstanding all this, there are companies active within the government's MIDP (**see Section 8.2.1**).

7.5.3 Die Casting Alloys

There are two groups of zinc die casting alloys – defined by their aluminium content. The traditional low aluminium (4%) alloys with varying amounts of copper were developed in the 1920s. These are marketed as Zamak alloys in the USA, Mazak alloys in the UK. The more modern high aluminium alloys (ZA Alloys) were developed in the 1970s for gravity casting and are widely used in die-casting. The different Zamak Alloys are numbered 2, 3, 5, 7; the ZA Alloys ZA-8, ZA-12 and ZA-27 depending upon the aluminium level. ZA Alloys are good substitutes for cast iron, bronze, aluminium and steel. They are castable at low temperatures, exhibit high strength and have good bearing properties – often better than standard bronze bearings. In the early 1990s high temperature, creep resistant alloys such as ILZRO 16, Zatec and Acuzinc were developed. However, these did not address some specific creep and stress resistance properties requested by some consumers. As a result of this an ILZRO Research programme was started to look at further developments. Interestingly, this work is being carried out by the CSIR. In South Africa the most widely used alloys are as shown in **Table 39**. BS 1004 was replaced in 1998 with EN 1774. **Table 40** shows the closest equivalents for comparison purposes.

Table 39. Commonly used die-casting alloys in South Africa.

Alloy type	Specification	Basic composition	Applications
A	BS 1004:1992	Al – 3.9 to 4.3 Mg – 0.04 to 0.06 Cu max 0.01 Fe max 0.05 Pb max 0.003 Cd max 0.003 Sn max 0.001 Ni max 0.001 Zn rem	auto parts, appliance fixtures, office & computer equipment, building hardware
B	BS 1004:1992	Al – 3.5 to 4.3 Mg – 0.04 to 0.06 Cu – 0.75 – 1.25 Fe max 0.05 Pb max 0.003 Cd max 0.003 Sn max 0.001 Ni max 0.001 Zn rem	auto parts, appliance fixtures, office & computer equipment, building hardware

Table 40. Equivalents for various zinc die-casting alloys *(taken from Annexe A of BS EN 1774:98 Zinc and Zinc Alloys – Alloys for foundry purposes – Ingot and Liquid)*.

Alloy symbol EN 1774	Alloy Number	UK – BS 1004	USA ASTM B240/B669	Common Designation	Germany DIN 1743/1
ZnAl4	ZL0400	Alloy A	AG40A	No. 3	Z400
ZnAl4Cu1	ZL0410	Alloy B	AG41A	No. 5	Z410
ZnAlCu3	ZL0430		AG43A	No. 2	Z430
ZnAl8Cu1	ZL0810		ZA8		
ZnAl11Cu1	ZL1110		ZA12		
ZnAl27Cu2	ZL2720		ZA27		

In the South African market, scrap die-casting recycling is done on a customer specific basis. The re-supplied alloy is known as Alloy C. This has a wide specification range generally taken as shown in **Table 41**. It should be noted that the British Standards exclude the use of secondary zinc or scrap originating outside the die casting plant. Alloy C complies with this requirement in that recycling is done using customer specific arisings only.

Table 41. Scrap generated die-casting alloy specification (South Africa).

Alloy type	Specification	Basic composition	Applications
C	Local South Africa	Al – 3.6 to 4.4 Mg – 0.03 to 0.07 Cu max 1.25 Fe max 0.07 Pb max 0.008 Cd max 0.006 Sn max 0.002 Ni max 0.1 Zn rem	auto parts, appliance fixtures, office & computer equipment, building hardware

7.5.4 Zinc uses in the SA Die Casting Industry.

Because of their high fluidity, zinc alloys can be cast in much thinner walls than other die casting alloys and they can be cast to tighter dimensional tolerances. Consumption patterns for zinc in the industry are shown in **Table 42**. There is some overlap here with the brass industry where cast products are produced for certain markets (such as the marine ancillaries market). The current price ratio of aluminium to zinc is 1.7:1. As the ratio of density of aluminium to zinc is 0.38:1, the overall cost per volume of aluminium to zinc is 0.65:1. Therefore, on a pure alloy cost, aluminium is 65% of the cost of an identical product made from zinc. Clearly, this does not take into account die life, etc. However, some of the changes outlined below are easily explained by this price differential.

Table 42. Zinc use in the SA die casting industry.

Sector	1995		2000	
	%	Zn ≡ tonnes	%	Zn ≡ tonnes
Auto products	15		30	900
Electrical	20		20	600
Hardware	65		50	1500
TOTAL	**100**		**100**	**3000**

7.5.4.1 Auto products

The sector showing the most focus in the die casting market is that related to the auto industry. For this reason, this report will concentrate upon this area.

Supply into the auto industry requires that suppliers hold the Q1 quality system in the case of Ford, Daimler Chrysler and General Motors. This system requires (from February 1st 2002) first tier suppliers to hold TS (Total System) 16949, which combines ISO 9002 and ISO 14 000. The Q1 system is a marking scheme whereby suppliers start with 10 000 points and points are removed depending upon their delivery, quality standard compliance, customer support, etc. Below a certain threshold of points the supplier looses Q1 status. Volkswagen and BMW operate the German VDA 6 system and Toyota has the "A rating" system. The implications for the die casting industry are dire. No local die caster meets Q1 requirements and, indeed, the industry, and in particular the high-pressure die casting industry, is viewed as sub-standard by all the automakers. Compliance with VDA 6 generally means being a subsidiary of a European supplier (an equity partner is not acceptable). ASTAS were the suppliers of choice before the company folded. An initiative by Fiat who has brought Belmac (part of the Almec Group in Italy) into the country is being watched with interest. This company, as a subsidiary of a first tier European supplier, has a captive market and uses state of the art equipment.

Action in the auto component industry centres on the National Association of Automotive Component and Allied Manufacturers (NAACAM) and the operation of the MIDP. Die cast parts are made for starter motors, alternators, wiper systems, seat belt spindles, differential covers, engine mountings, etc. Supply is on cost, quality taken as a given. Costing structures are based upon fixed 3 monthly terms based upon the 3 previous months. An alloy surcharge system is employed to cater for the volatility in the zinc price. Unfortunately, the majority of die casters are termed secondary suppliers and therefore benefit from the MIDP only in that volume business is developing. Supply into the auto industry is via the OEMs. As a result, it is only by forming a supply partnership with these companies that the die casters can increase volumes. Zealous and Natal supply Robert Bosch. To be effective the cast product has to be finished (machined). Some of the developed partnerships, e.g. Natal with TPS (who are finishers) have provided a basis for increased business. The Auto-benchmarking Club provides operational benchmarking services (HR development, Supply Development and Logistics) for suppliers. Indeed, indirectly, this group forms part of the Working Committee on the MIDP.

It is clear that the development of this area requires liaison with IZA activities and supply partnership development to produce business results. All new programmes are determined overseas and, therefore, only by influencing these decisions will local supply be possible. Thus, design requirement and alloy type are dictated from overseas. However, two issues are worthy of comment –

1. All the auto manufacturers are looking at use of local facilities for production of an export model so opportunities exist.
2. For future development (and therefore growth) it will be necessary to put the local industry in contact with European or American first tier suppliers.

An industry grouping would be required to take the MIDP initiatives widely into this industry. Clearly, a competence/confidence gap has to be bridged to open this market to more participants.

7.5.4.2 Electrical

There are a number of companies specialising in electrical products (3). However, in addition, the small jobbing die-casters produce a host of electrical products ranging from light fittings to electrical control boxes. A major advantage of zinc die castings is that they are "non-sparking" so is commonly specified in fire risk areas such as refineries, mines, etc. Nevertheless, there has been a move towards plastics in the white goods market.

7.5.4.3 Hardware

This market is best divided into general hardware and security.

7.5.4.3.1 General Hardware

The local market for hardware products went soft in 1997. However, there has been some recovery of late. The market conditions resulted in a shakeout in the specialist hardware producer market. Non-specialist die-casters supply this market on a low margin basis and therefore input material costs are a big factor in their lives. Numerous small companies represent this sector. Other than the specialist product producers (such as Safa) there is insufficient cohesiveness in this industry sector. This has to be addressed, as there is a preference for zinc die-casting as it can be plated easily. Although the price of zinc is an issue forcing some movement away from zinc to aluminium, there is also a move back to zinc from plastics. All the companies contacted are operating at under capacity (estimate average to be as low as 50%).

All the specialist companies see improvement in zinc consumption over the next few years. However, all of this growth will be from exports. Assuming that these companies represent 30 – 40% of consumption in this sector and the export volumes quoted by the companies happens (growth rates of 20 – 50% over the next 2 to 3 years) some added 500 to 1500 tonnes of zinc should be consumed per year. Typically, this industry uses grade A exclusively.

7.5.4.3.2 Security

This industry is now a monopoly locally with alternative supply being in the form of imports. Josiah Parks (who owned the Union Lock Company) was sold to Chubb Industries. Thus, Chubb had the European continent covered. Williams (USA), who owned Yale (Union's biggest competitor), bought Chubb to provide world market coverage with the names of Chubb and Union. Williams decided to split the business, wanting to float Chubb. However, before this occurred Assa Abloy made an offer and secured Chubb (1996). In 2000 Assa Abloy bought Yale/Union worldwide. In South Africa, Assa Abloy bought Viro/Solid in July 2001. This final acquisition more than doubled the market volumes for Assa Abloy making essentially a monopoly lock business in South Africa. Manufacturing is on three sites – Roodepoort, Robertson and Rosslyn. Rosslyn and Robertson have die-casting facilities. Overall, employment

is down by 15% over a ten-year period. Robertson focuses on lever locks, etc. (using chiefly Alloy A), Roodepoort on padlocks and architectural products and Rosslyn on OEM products. The latter plants use Alloys B and C. This year consumption of zinc will be of the order of 140 tpm (1600 tonnes per year). This is up after a poor 1999, 2000 and 2001. It is estimated that Assa Abloy has 60 – 70% of the local market. 2/3/4 lever locks use galvanized products, brass and zinc (die-castings). Competition to the latter is aluminium, brass and even stainless steels. Some 400g of zinc are used in each 2-lever lock. Aluminium offers the advantage of fewer operations (no electroplating required) and overseas (Chinese) competition has meant that steel back plates have replaced zinc on cheaper locks. This movement to plated steel in some instances and even stainless steel for plate-work is due to the smaller number of operations needed. Indeed, this switch has resulted in 50 to 60% of output using steel back-plates. Thus, pricing is a sensitive issue. However, there has been a significant improvement in local volumes from 180 000 units to 350 000. This has been due to several factors:

- A successful anti-dumping action against Chinese imports (2/3/4 lever locks now carry a 45% import duty from China, up from 20%)
- The devaluation of the Rand has made local products more attractive
- Importing distributors have switched to local supply.

The company has embarked upon the "Proudly South African" campaign. However, plant utilisation is still on a 41-hour week basis. Therefore, capacity for added export still exists. The brand value of the product has assisted in exports, primarily into Africa. The company was the first outside of the UK to obtain the BSI Kite Mark. However, in addition local supply to Yale UK of locksets and padlocks is worth R200m per year. To supply cheap locksets, 15 to 20% of the product supply is imported.

7.5.5 Trade

The majority of die cast products go into other goods. Whether this is traded locally or internationally is difficult to determine. However, it is estimated that other than the specialist companies and supplies into auto-products a significant percentage of product is exported (>20%).

7.5.6 Opportunities

This industry sector includes direct zinc products such as wire, rod, etc. As these products are produced via a single source, clearly, any assistance would have to be company specific. Notwithstanding this, it is suggested that dialogue be opened to look at improving capacity utilisation (and therefore volumes of zinc consumed).

The die-casting industry has shown considerable decline during the 1990s. As discussed above, a number of specialist companies have moved into exports with great success. Therefore, the specialist companies (product specific) appear to be in good shape, whereas the general jobbing operations are battling.

Many of the respondents were unaware of the opportunities available in South Africa, such as government development assistance, the workings of the MIDP and the CSIR activities. In addition, the larger players have a need for specialist business personnel.

These requirements and the Initiative activities would be best served on an individual basis. In addition, this would assist in gaining a better understanding of the industry drivers and assist in its development.

Notwithstanding these comments, the issues facing the die casting industry are similar to those facing the brass die casting industry. It is recommended that a Joint Action Group encompassing these two industries be formed to address the cross cutting issues.

If this industry is operating at such a low capacity an increase of a third (3000 tpa) should be achievable.

8. CONSUMPTION (END USER) ECONOMIC STATISTICS

Through the Zinc Industry-Market Development Alliance, the following sectors have been identified as end users of zinc:

1. The public infrastructure sector
2. The transport sector
3. The construction sector
4. The machinery and equipment sector
5. The Consumer Durables sector.

An estimate of current market demand for zinc per sector is shown in **Figure 15**. To estimate potential future demand, it is pertinent to look at the leading indicators as opportunities for growth.

8.1 Public Infrastructure

This sector provides opportunities for the galvanizing, brass and to a lesser extent, battery manufacturers.

The following factors are viewed as important:

1. Public expenditure on education, health and other public services.
2. Percentage fixed capital expenditure versus consumption expenditure.
3. General business cycle.

Leading indicators of future performance of this sector are available as:

1. Budgetary figures
2. The medium term framework

8.1.1 Comment.

As shown above, government capital expenditure is estimated to grow at 15% a year for the foreseeable future. This type of expenditure pattern will reverse the recent trend where government has become a smaller customer for certain goods than in the past. High expenditure projects in water delivery and electrification such as those locally (new Port Elizabeth electrification schemes, Coega Harbour, etc) and the move by Eskom Enterprizes into Africa provide significant opportunities for increased demand of infrastructural goods.

It is clear from this analysis that current thinking is that a 10 - 15% growth is anticipated in this sector. This could well lead to similar growth in the demand for galvanized, alloy, brass and battery products. Analysis of past performance targets versus delivery indicates that a shortfall delivery may be of the order of 2 to 4%. Therefore, likely growth in this sector will be 8%. If market share is increased, clearly a substantial increase over and above this figure should be attainable (10% pa). Methods to attain this may be obtained by analysing the interventions of the IZA elsewhere.

8.2 Transport

This sector provides opportunities for the galvanizing, chemicals, die-casting and battery manufacturers. This sector is essentially divided into infrastructural development, which comprises government capital expenditure (roads. railways ports), and the automotive industry.

The following factors are viewed as important:

1. Contribution to economy.
2. Public expenditure on all aspects of transport.
3. Percentage fixed capital expenditure versus consumption expenditure.
4. Car and truck sales (total including export). Clearly, as the automotive industry is an important role player in this industry, sales of vehicles provide an opportunity for the zinc industry. This industry is further assisted via the MIDP.
5. Export of auto components.
6. Transnet Revenue

8.2.1 The Motor Industry Development Programme (MIDP).

The Motor Industry Development Plan (MIDP) is administered by the Department of Trade and Industry (dti). It is simple in concept and has resulted in significant development of the local auto and auto component industries. It was devised to develop these industries in recognition that most countries operate some incentive scheme for their auto industry. In essence, the mechanism (started in 1995) attempts to promote the development of local competitiveness by means of gradually lowering import duties of vehicles and parts by the use of tradable export credits for exports of vehicles and parts.

The importation of completely built up (CBU) and completely knocked down (CKD) cars and light commercial vehicles may form part of the scheme. Four mechanisms of duty relief apply – the duty free allowance (DFA), the small vehicles incentive (SVI), import/export complementation (IEC) and the productive asset allowance (PAA).

The DFA is simple in that 27% of the wholesale value for the vehicle is exempt from duty. The SVI allows an extra deduction where the wholesale value is below R40 000. The IEC permits reduction of import duties. For every Rand of CBU exported a Rand of CBU or components (either for CKD or the aftermarket) may be imported duty free. For every Rand of components exported 70c of CBU or R1 of components can be imported duty free. The duty free import percentages are to be lowered over time to encourage further exports.

The scheme in controlled via the issue of Import Rebate Credit Certificates (IRCCs), which are tradable.

The success of this programme is seen through reference to **Figure 29**. As can be seen from **Figure 30**, the unit local sales of vehicles in South Africa are relatively small. Indeed, it is the support of the MIDP that has fostered the development of a vibrant auto industry (auto makers and component suppliers). This has permitted development beyond the norm for the economy.

Figure 29. Export sales of vehicles from SA ***(2001, 2002 are projections)*** **(Source Naamsa).**

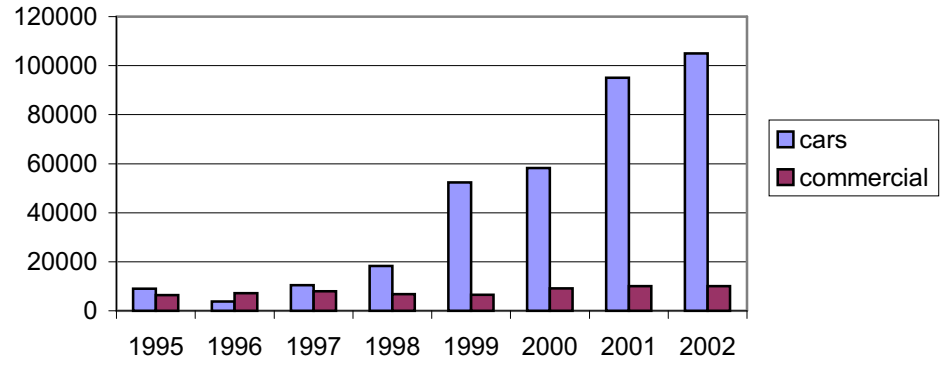
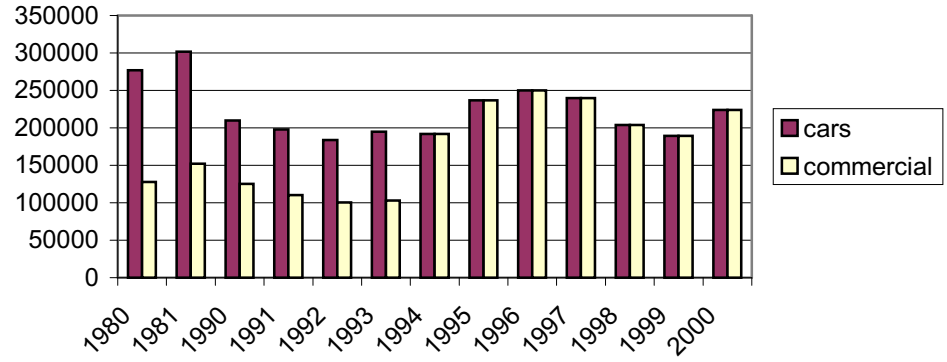


Figure 30. Sales of vehicles in South Africa (Source Naamsa).



The International Energy Agency has shown that once GDP per capita exceeds $2000, the demand for personal transport increases markedly. The disparity in per capita consumption is shown in **Figure 31**. Current GDP per capita in South Africa is R18 500 ($1700 - $2000). Therefore, there is very little doubt that in addition to improved efficiencies being brought about by the MIDP, car sales should show medium term growth rates in excess of GDP growth as the number of vehicles sold per capita increase. As discussed previously, all the local car manufacturers are looking into local production of an export model. This will result in increased opportunities for those suppliers into this sector.

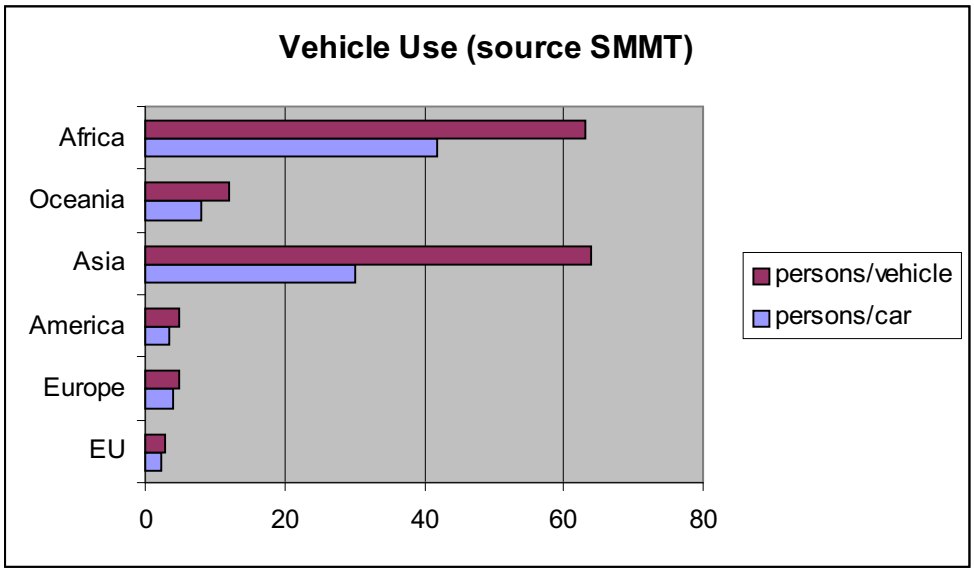


Figure 31. Regional vehicle use showing the low vehicle to person ratio in the developing world (Source SMMT ref. ILZSG).

Leading indicators of future performance of this sector are available as:

1. The medium term framework
2. Anticipated exports of vehicles.
3. Building activity
4. Road construction

8.2.2 Comment.

From the 10% growth figure for sales of new cars, the projected increase in infrastructure spend and the revenue increases of 2 – 3% by Transnet, current thinking is that a 5 - 10% growth is anticipated in this sector. This could well lead to similar growth in the demand for galvanized, die cast, zinc oxide and zinc battery products. Particular attention needs to be paid to the MIDP scheme, which is yielding solid returns for its participants.

8.3 Construction

This sector provides opportunities for the galvanizing, brass and to a lesser extent, battery manufacturers.

The following factors are viewed as important:

1. Contribution to economy Rm.
2. Interest rate environment. Numerous economists are of the opinion that we are at the bottom of the current interest rate cycle. This has been discussed previously.
3. Profitability of the sector.
4. Investment in buildings.

The South African Reserve bank in its Q4 report for 2001 showed a desperate picture of the construction industry after revising its figures. Essentially, there has been no growth in the industry since 1995 which saw a 9.3% increase in investment (BIFSA,

2001 – see **Figure 32**). This is not surprising given the high interest rates experienced during 97/98 of 25%. There was a rise in plans approved during 2001, which indicates that a recovery is imminent if interest rate concerns abate. Also, according to BIFSA some of the major projects (such as the Gateway Shopping complex) have not been included in the figures. Non-residential investment is depressed as markets have reached a saturation level in recent "high growth" areas such as Sandton, Roodepoort and Midrand. Casino projects, that are reaching completion stages across the country, are compounding the impact on reduced investment levels. Investment in the non-residential sector is not expected to recover before 2004 / 2005, as business confidence needs to stabilizes and markets expand. Private sector involvement is critical to revive depleted investment levels. Projects such as Blue IQ in the centre of Johannesburg are a good example of where infrastructure development will do a great deal to eradicate poverty and promote growth.

The contribution of the mining sector to the economy of South Africa means that it deserves special mention. In 2000, Mining GDP grew by 6.5% versus 6.1% in 1999. Between 1991 and 2000, the non-gold sector grew by an average rate of 2.6% versus 1.6% for the rest of the economy (source Chamber of Mines of South Africa). Historically, this sector has provided a good opportunity for corrosion protection with in excess of 1% of all annual mining expenditure being on paint (Chamber of Mines). The Mining Industry in South Africa has undergone a change to make it the most successful industry Cluster in South Africa. This is in direct contradiction to popular belief.

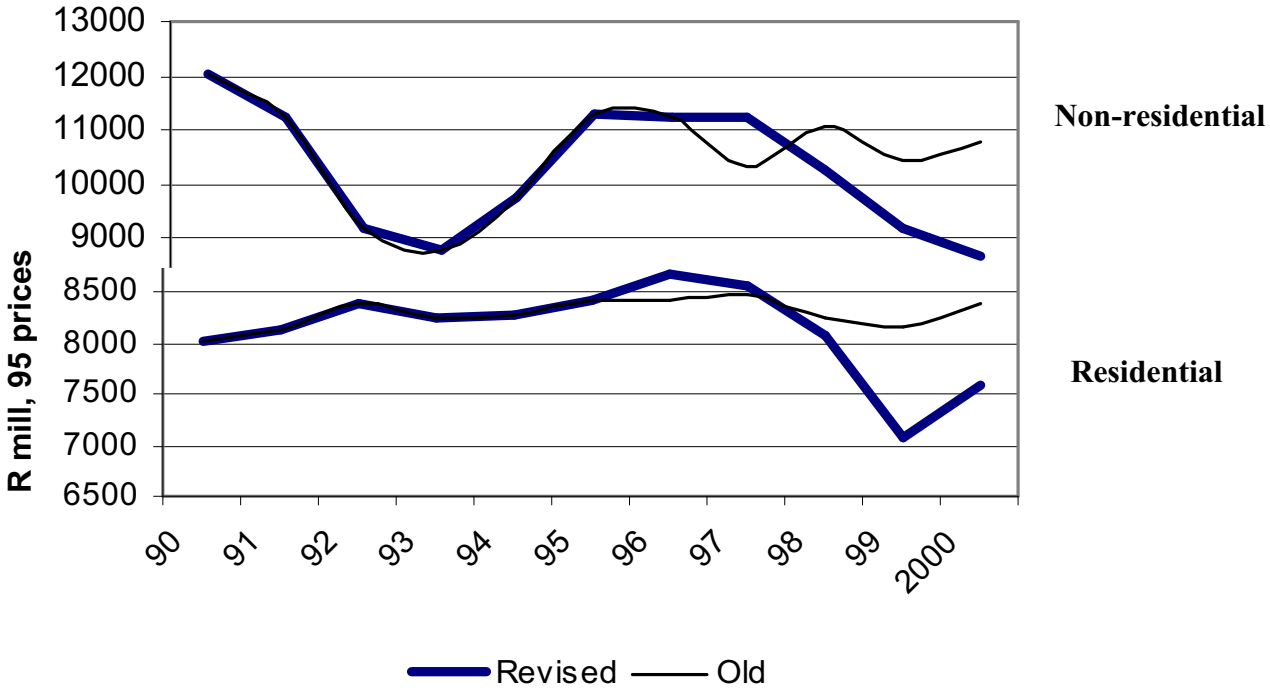


Figure 32. Residential and non-residential investment during the 1990s (Source BIFSA).

This report is not intended to be a comprehensive treatise on the performance of the industry sectors in South Africa but, in respect of mining, a few comments indicate the opportunities for the construction sector.

1. Production of all minerals has increased with the exception of gold and manganese. Coal, platinum and chrome production has doubled since 1980, iron ore production by 50%.
2. Mining and beneficiation account for 50% of South African exports.
3. One in seven African men are employed in the Minerals Industry.
4. The minerals industry is the largest direct foreign investor in sub-Saharan Africa. Significant infrastructural development follows these investments to effect efficient economic growth.

South Africa is now recognised as the centre for mining services and technology worldwide. Helped by cheap power, metals know-how and good base metal deposits the metals processing industry is attracting large capital investments. These developments provide tonnage opportunities for zinc in galvanizing and paint, not only in South Africa, but correctly leveraged, regionally and even worldwide.

Leading indicators of future performance of this sector are available as:

1. Building plans approved. The real value of building plans passed by the private sector dropped by 8% in the first eight months of 2001 compared with 2000, after a 8% increase in January and February. Value of non-residential plans passed is down a further 22%, extending the downturn in this market segment. The value of residential plans passed are still on an upswing but have slowed to a growth rate of 2,8% from 11% in May. The real value of contract awards rose 18% in 2001 (inflationary adjusted), whilst volumes (number of contracts) increased by 27,4%. Although the recovery is coming from a low base given the decline in awards this time last year, the fact that the real value of awards has increased for ten consecutive months is encouraging. The higher growth was fuelled by the residential sector (up 21%), whist the value of non-residential projects ended 7% lower than last year. Another indicator measuring the "health" of the building industry is the number of projects that are postponed. In 1999, more than 40% of total building projects were placed on hold or potentially cancelled, which then eased off to 30% in 2000 and is currently down to 10,3%. It has probably reached the lower turning point given relatively uncertain monetary market conditions **(source databuild)**.
2. Electricity generation predictions. Whilst there are no plans for major capacity building by Eskom, there are plans to site a new Pebble Bed Reactor near Cape Town, new electrical distribution installation in the Port Elizabeth area and the electrification programme for Coega harbour. However, the restructuring of the electricity supply industry through the merger of Eskom Distribution and the Municipalities via the initial formation of EDI Holdings will provide opportunities as the electrification rollout progresses. This is the first step in the eventual deregulation and privatisation of the Electricity distribution industry in South Africa. Combined with the activities of Eskom Enterprizes (which acts as operator and technical consultant) in Africa provides for massive opportunity in the galvanizing industry.

3. Cement sales. These increased by 3,4% and 2,3% in South Africa and neighbouring countries respectively (2001 versus 2000). This is a reliable indicator of current construction activity as it includes informal building activity not recorded elsewhere.
4. Aggregate share performance for the sector.

8.3.1 Comment.

It is clear from this analysis that current thinking is that growth will merely reflect GDP growth for 2002. However, should the rise in interest rates be minimal, growth may well rise by 3% per annum for the next few years. This could well lead to similar growth in the demand for galvanized and brass products. The large percentage contribution to zinc consumption of this sector (50%) indicates that any improvement on the consensus growth will lead to significant growth in zinc consumption. Analysis of the health of the industry (as shown in the performance of the sector on the JSE) indicates that there is sufficient capability to perform profitably in this sector. If market share is increased, clearly a substantial increase in galvanized steel usage could be secured. This sector has a unique character in South Africa, i.e. the mining and minerals sector. This sector has shown substantial growth over the past decade. It is likely that construction activity will intensify over the next few years. However, the installation of new facilities, such as galvanizing plants, could lead to overcapacity once the current development projects in the platinum, coal and aluminium mining industries are concluded. The best advice here is to "make hay while the sun shines".

8.4 Machinery & Equipment

This sector provides opportunities for the galvanizing, die-casting, brass and battery manufacturers.

The following factors are viewed as important:

1. Contribution to economy.
2. GDFI.
3. Machinery exports.

Leading indicators of future performance of this sector are available as:

1. Changes in inventory stocking. It is clear from the information presented above that inventory stocks are at a low position. It may, therefore, be considered that capital expenditure forecasts should be favourable to the machinery and equipment sector.
2. Business Confidence Indices. This shows a recent promising trend.
3. Growth in key export markets. The Capital Equipment Export Council (CEEC) was formed a couple of years ago with the view of growing the exports of capital equipment from South Africa. The CEEC now has some 200 members. The major markets are the project and retrofit/after markets. The CEEC has been uniquely successful and the current restructuring of the Export Councils has resulted in the CEEC now encompassing Capital Equipment (Mining, Agriculture, Building Construction, Processing and Utilities), Engineering Consulting, Fabrication, Contracting and Banking. This consolidation has resulted from the need to provide packages from conceptualisation to commissioning. As this body has turned itself into a

Comprehensive SA Exporters Group, contact has been made to become a part of the Joint Action Groups that will meet in the near future. A particular focus should be contact with the Consulting Engineering and contracting firms that are now active within this group.

8.4.1 Comment.

It is clear from this analysis that initially opportunities exist for the galvanizing industry in particular. Due to the project nature of this sector, it is difficult to predict annualised growth rates. Sufficient to say that focus on exports is necessary and even if on a project-by-project basis, close co-operation is required between the galvanizing industry and the capital goods sector.

8.5 Consumer Durables

This sector provides opportunities in all the zinc sectors but provides opportunities particularly in the chemicals and battery sectors

Consumer confidence and income are the primary factors affecting the performance of this sector. Traditionally, this has been measured by:

1. Interest rate environment.
2. New car sales.
3. Retail sales figures.
4. CPIX.
5. Unemployment figures.

Leading indicators of future performance of this sector are available as:

1. Predictions of CPIX. Consensus predictions are that after a rise to 8.1% for 2002, the CPIX will track the previous direction and reach 5.6% in 2003.
2. Predictions of Interest rates. Economists are of the opinion that a one or two percent rise can be anticipated this year. However, as the economy is still in a fragile position, barring surprises, there will be no aggressive rate rise that could stall an economic recovery.
3. Consumer confidence index. The FNB/BER Consumer Confidence Index showed a remarkably high rise in the first quarter of 2002 (see **Figure 10**). If sustained, this rise will result in an increase in retail sales.

8.5.1 Comment.

As discussed previously, part of the macro-economic policy of government is inflation targeting to provide stability and long-term growth. This can only be achieved when currency and interest rate stability is maintained. Unfortunately, the events of last year have impacted adversely on the Reserve Bank's inflation targeting and as a consequence the interest rates are likely to rise to maintain stability. This does mean that 2002 may be a tough year for consumers. However, the RMB/BER Business Confidence Index (which is taken from confidence in the building, construction, manufacturing, retailing, wholesale and vehicle sector) indicates that the current situation may be temporary. An anomaly of the South African situation is the disparity in expenditure patterns. The richest 20% account for 65% of all spending (with expenditure of greater than R55 000 or $5 500 per year) in the country (**source**

Stats SA). This has to be factored into any analysis. Therefore, barring any surprises, consumer confidence is essentially on a long-term rise.

9. SPECIFIC OPPORTUNITIES

9.1 Identified projects

A summary of the market opportunities and the potential of delivery to these sectors are shown in **Table 43**. The analysis uses the five forces model utilised throughout the various industry Cluster Studies. The presentation is provided as a point of departure to assist in the selection of the projects for further development. From Table 42 some 14 500 tonnes is identified as available for development. This is nearly 40% of the total development desired by this initiative. Without doubt, the remaining 60% could be realised from value adding via the semis route. This particular area requires consideration by all the current market participants.

9.2 Cross cutting issues

Within each market, either by first or final user segment a number of common issues arise. Wherever possible, joint action should be taken with an industry partner/association.

9.2.1 Die Casting

The Die Casting industry appears to have similarities irrespective of whether aluminium, brass or zinc is used. Markets tend to be in the transport (automotive) and construction (hardware, plumbing and electrical) sectors. Thus, local prospects are dependent upon the performance of these sectors and the drivers impacting upon them. Companies in this group can be clearly divided into own-product specific or supply to assemblers. There are a few product-focused companies combined with a myriad of jobbing operations of various sizes and overall competencies. Overall, capacity utilisation in this industry varies from 50% to 90%. An analysis matrix as a basis for discussion is shown in **Table 44**.

Table 44. Analysis of the SA Die-Casters.

Large companies (> 200 employees)	Medium companies (up to 200 employees)	Medium companies (up to 200 employees)	Small companies (less than 25 employees)
High tonnes	Medium tonnes	Medium tonnes	Small tonnes
Branded products	Generic product suppliers	Item suppliers	Item suppliers
ISO 9002 certified	ISO 9002 certified	Some ISO 9002 certified	Not ISO certified
Own promotion	No promotion	No promotion	No promotion
Export focus	Export focus	Local focus	Local focus
Amenable to groupings	Amenable to groupings	Amenable to groupings	In the cold

Table 43. Analysis of potential projects in terms of "five forces" model.

End user sector	First user sector	Potential*	Firm, strategy & rivalry	Demand conditions	Related supporting industries	Factor conditions	Government
Public infrastructure (projected 8% growth)	Galvanizing	2000 tpa (Eskom)	Good (rivalry)	Good	Good	Good	Gov/Provinces/SOE control spending. Need to focus on Departments
	Brass	(all tonnes put in construction)	Poor	Weak (import issues)	Weak (material prices)	Good	
	Die-casting		Poor (industry co-ordination)	Weak	Good	Poor	
Transport (projected 5 – 10% growth)	Galvanizing	200 tpa (chassis)	Good (rivalry)	Weak	Good	Good	MIDP, IPP – gov. incentives need leveraging
	Die-casting		Poor	Weak	Weak	Poor	
	Rubber	500 tpa (exports)	Good	Good (exports)	Good	Good	
Construction (projected 3% growth)	Galvanizing	1200 tpa (scaffold), 1500 tpa (conveyance), 500 tpa (light steelwork)	Good (rivalry)	Weak (except mining)	Good	Good	Interest rate climate, import controls
	Brass	2000 tpa (counter imports)	Fair	Weak (import issues)	Good (material prices)	Good	
	Die-casting		Poor (industry co-ordination)	Weak	Good		
Machinery/Equipment (difficult to predict growth rates)	Galvanizing		Poor	Weak (not co-ordinated)	Good	Good	Dti incentives for export
	Brass		Poor	Weak	Fair	Good	
	Die-casting	1500 tpa (security/hardware)	Poor	Weak	Fair	Poor	
	Rubber		Good	Good	Good	Good	
Consumer (projected 3% growth)	Battery		Monopoly	Fair to Good but spending dispersed. Security market good.	Good	Good	Interest rate climate, import controls
	Die-casting		Improving		Good	Good	
	Galvanizing		Good		Good	Good	
	Brass	(all tonnes put in construction)	Poor		Good	Good	
Agriculture	Galvanizing	2000 tpa (wire)	Good	Fair	Good	Good	Interest rate climate, import controls
	Fertilizer	3000 tpa (increase in zinc content)	Good	Good (spending dispersed)	Good	Good	

*** Entries are based upon potential where interventions are required**

Many of the respondents to this survey were unaware of the government programmes available to facilitate exports, expansions, etc. A few were leveraging these to the maximum and were complimentary of the way in which government assistance was working. Scrap availability is a key issue in the viability of this sector. It is essential that at the JAGS dti representation is present and that the opportunity be afforded for those receiving government assistance to share their experience with a similar group. The business development of zinc related industry should form one of the objectives cornerstones of the IZASA.

9.2.2 Oxide users

The chemicals sector depends completely upon the supply of oxide from recycled sources of zinc. The rubber industry is closely tied to global players where raw material supply is, to some extent, centrally controlled. All the tyre manufacturers contacted indicated that there were opportunities. However, these were being developed on a company-by-company basis. However, the fertilizer manufacturers indicated that despite inter-company competition opportunities existed to raise consumption by 50% simply through reinforcing the awareness of the essentiality of zinc. In view of the IZA activities in this area an approach to the fertilizer industry to could be of benefit.

9.2.3 Galvanizing

Various aspects of the galvanizing industry are common, e.g. dependence upon the steel industry and promotion against competitive corrosion protection solutions. Whilst the Hot Dip Galvanizers Association of Southern Africa is active in the general galvanizing market some specific projects have been identified that are outside of the current activities of the Association. These specific projects would be best carried out in partnership with a champion association, identified as the most relevant for the project. As a basis for discussion, the identified projects are listed in **Table 45**.

Table 45. Suggested route for various galvanizing projects.

Project	Potential (tpa zinc)	Partner?	Comments
Utility Poles for Eskom	2000 (min)	SAISC, astpma	Specifiers need to be contacted via technical engineering information, costs, seminars (could use IZA inputs)
Light gauge steelwork	500 (min)	SAISC	Specifiers need to be contacted via technical engineering information, costs, seminars (could use IZA inputs)
Scaffolding	1200	HDGASA	Currently in progress
Light gauge conveyance tubing	1500	astpma	Currently in progress
Galvanized chassis	200 (min)	HDGASA/IZA	Specifiers need to be contacted via technical engineering information, costs, seminars (could use IZA inputs)
Wire	2000	SAWA/ Iscor/SAISI/ SABS/Various key wire companies	Requires a concerted industry effort. In process.

9.2.4 Building and Construction Industry

Although the building and construction industry locally appears to be subdued, the galvanizing industry (continuous, general and tube) depends heavily upon this industry for tonnage take-off. Also, infrastructure development primarily encompasses building and construction. Currently there is no information forum to pool information pro-actively. An example would be the supply of roofing to a steel framed building where paint has been specified. With the larger projects, competition is fierce and, often, the industry players are aware of the project, etc. However, these projects still represent a small proportion of the overall activity in the industry. A working information forum could empower the industry to better gain market share. Regularly convened, this forum could also develop overall sustainable promotion strategies.

9.2.5 Transport Sector

This sector is essentially the auto industry. Worldwide galvanizing specifically has been successful in addressing the needs of the automakers. The difficulty in South Africa is that decisions are made elsewhere on component design and selection. For component manufacturers in South Africa to successfully supply the auto industry two primary issues need to be addressed:

1. The component supplier has to be accredited. Generally this is only achieved via being either a subsidiary of a foreign supplier or at least operating a JV with a foreign supplier. The different automakers have different criteria but these principles have to be met.
2. Local component suppliers have to be aware of what is happening overseas in order to be able to meet changing requirements as the galvanizing and die-casting industry overseas successfully delivers product into the industry.

Where latitude is possible (such as the local successful galvanizing of bakkie chassis) this success needs to be built upon to develop the market further.

9.2.6 Agriculture Sector

Although the agricultural sector is not described in the end user analysis, two important zinc first user sectors supply into this area, viz. galvanizing and fertilizers. The wire industry is currently a major supplier into agriculture and the fertilizer industry provides an opportunity for growth. Whilst the first user segments are not entirely related a virtual JAG could provide a platform for developing an overall strategy for the zinc industry to target this end user sector.

9.2.7 Government Schemes

The MIDP has developed an active auto component industry. However, the development of this within the zinc industry has been weak. Liaison with the Aluminium Federation of South Africa (AFSA) and the various automakers has shown that raw material input costs are the key issue in the development of the die-casting industry. Forums exist in an attempt to address these issues and, whilst not successful so far, this Initiative needs to be party to these discussions. The issue of the

competition between the aluminium and zinc die-casting industry does not exist in South Africa due to the overall parlous state of the industry. We should rather be party to overall development schemes and then look at the competitiveness issues. The Industrial Participation Project scheme needs to be investigated further to see what opportunities exist. Similarly, a number of the industries contacted where unaware of the various government schemes for business. Issues brought up in discussion included small business development, depreciation allowances and export financing. A simple industry forum could help address this information gap.

9.2.8 Raw material prices

Whilst every company may make some comment upon the zinc price, its impact upon certain user segments is clear. In the case of hot dip galvanizing a recent study has shown it to be cost-effective compared to other forms of corrosion protection. This finding needs to be communicated to the market place in an aggressive manner. In the case of die casting/brass benchmark pricing experienced elsewhere needs to be carried out to determine whether local industry is indeed disadvantaged. This will be carried out in the international comparison study.

9.3 Information transfer

The initiatives carried out by the IZA have covered most of the zinc industry. Whilst beyond the scope of this report, these will be investigated to see where relevant activity is proving useful in market development. Also, within the local arena, significant information and expertise exists (such as business skills within the IZA member companies, the Die-Casting expertise at the CSIR and that developed through the Aluminium Federation of Southern Africa). This has to be leveraged to assist in capacity development of the industry.

9.4 Business Parks

The development of a “Techno-Park” should be considered as a method of fostering SMME development and providing skills development in areas. The development of the Middelburg Hive provides a model to be copied.

As part of regional development, seed financing was provided by the Mpumalanga Provincial Government for the development of local industry based upon the Columbus (stainless steel) presence. Some 16 x 50 m^2 mini-factories were built with a central workshop area and supporting office. Although this consumed the total R3.2m grant, it appears as if obtaining support monies once the facility existed proved relatively simple. Donors (local and overseas) were sought for provision of equipment, etc. In addition, dti funding for the overall development as part of the SMME programme was made available. As a result a support structure was provided (Workshop Manager, Equipment Operators, a sales person and an admin clerk).

As the primary funding came from the Provincial Government, the programme seeks to develop skills in Mpumalanga. Basic training is given in business skills and stainless steel working using the Columbus facilities and the Middelburg Training Centre. Using recognised training in terms of the National Qualifications Framework (NQF) companies are able to develop skills within the Skills Levy system.

However, the key feature of the model is its modus operandi. Via promotion, applicants are invited to submit applications for business proposals. These are reviewed and the successful candidates admitted and given the necessary skills as mentioned above. For year 1, facility supply is free. For year 2, rentals are 50% of the market rate, for year 3 rentals are 100% of the market rate and in year 4 they are 200% of the market rate. This forced eviction system results in SMME development in a competitive environment. The spin off of this is that whilst not all the businesses may succeed, skills development does occur. This in turn develops a region with a pool of skills that can be utilised by the larger investors that are sought for the area to further downstream develop the stainless industry. It is this latter offshoot that can be the deciding factor in local investment. Currently the stainless industry is looking at pilot sites elsewhere. In all fairness, the two success stories for the stainless industry, viz. the catalytic converter industry and the tanktainer industry, have been developed via foreign investment. The business park model seeks to offer the opportunities to repeat successes elsewhere. Clearly, the zinc industry would do well to look closer at the principle.

9.5 Other

The discussions above have focused specifically upon the growth of the zinc market by consumption or conversion. However, another area of opportunity is the further development of the zinc semis market. This market of wire, rod, bar, sheet provides opportunities in various markets worldwide. Currently the main companies in this arena are African Zinc Mills, MR Zinc and Zinchem. Due to the concentration of business any initiative would have to be on a company-to-company basis and is probably beyond the scope of discussion in this report. However, it is not unreasonable to expect that this industry represented by the aforementioned companies, and perhaps new entrants, could double the identified tonnage opportunities.