The sustainability of the South African Catalytic Converter Industry in the face of local and international pressures

A Research Report
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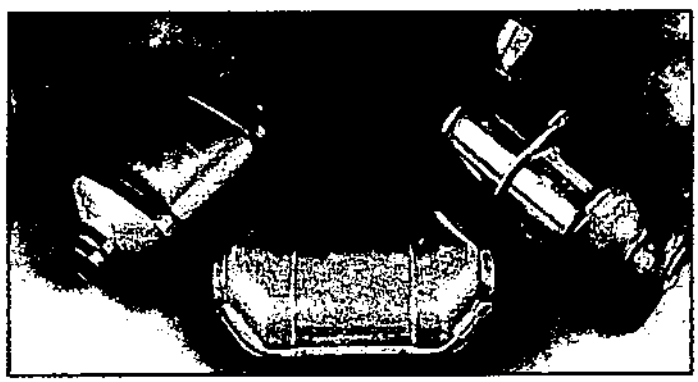
Graduate School of Business Leadership
University of South Africa

In partial fulfilment of the
Requirements for the
MASTERS IN BUSINESS LEADERSHIP
UNIVERSITY OF SOUTH AFRICA



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Acknowledgements

This research report is dedicated to my entire family, who have always supported me in my studies through all these years.

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I see all of the above as a reflection of the love and commitment shown to us all by Charles Williams Comyns Elfick, my Father, who was taken from us so young and who I know in my heart is proud of me and us all.

Till we meet again "Old Timer"

I would also like to thank my employer and my MBL group for keeping me going even when all seemed lost.

Abstract

- The primary objective of this research is to assess whether the success and continued sustainability of the Catalytic Converter industry is critically dependent on a legislative regime.

- The secondary objectives of the research are to:
  - Document the origins, history, growth and current structure of the industry
  - Look into the impact that the rapid growth of the South African catalytic converter industry has had on the International Catalytic Converter Industry.
  - Detail the short and long term prospects of the industry as seen by all the relevant role players, including identifying the risks facing the industry from, amongst others, legislative changes.
  - Determine the key factors required to ensure the industries on going success and long term sustainability in South Africa.

- The intention of the Research Report is to be very focused on the industry in question. The strategy would therefore not be to look for possible impacts on other areas of the economy or the possibility of a replication of this industry growth in another field.

- Factual research for this project was done by taking extracts from newspaper and magazine articles to supplement the information gathered during the interviews.

- Structured interviews and questionnaire responses were completed by top management of South African catalytic converter companies, members of the catalytic converter interest group and other relevant bodies.

- The information collected from the respondents was collated into a tabular format under specific headings to allow it to be analysed to in order to gain an understanding of the importance placed on each point by the participants.

- The responses allowed for the origins of the industry to be identified and its history to be traced in conjunction with information from other more formal sources.

- What was abundantly clear from the respondents was that without any action the catalytic converter industry as it stands now would cease to exist.

- The main ideas that came forward as regards what must be done to ensure the sustainability of the catalytic converter industry in South Africa can be divided into two broad categories being:
  - The governments involvement
  - The corporate strategies that are needed.

- The ways in which the government could get involved included:

- Replacing the Motor Industry Development Program with another scheme in the form of something like:
  - Reduced income taxation rates
  - International transport assistance
  - General Export Incentives Scheme
  - Low interest working capital loans
  - Local government assistance
  - Productive Asset Allowance Scheme
  - Foreign Exchange Earnings Incentive Scheme
  - Foreign Direct Investment Scheme
- Reduction of crime in the country
- Increasing stability in the country and its neighbours
- Negotiating with large corporates to increase their involvement in the local economy

- The corporate strategies needed include:
  - Reducing their reliance on the MIDP rebates
  - Increasing the world market share of this industry
  - Local government assistance
  - Training and motivating labour
  - Enhancing the links with the international technology suppliers
  - Merging canners to get a sound customer base.

- There was no doubt in the minds of the people approached that the catalytic converter industry is extremely important to the South African economy.

- Just as certain however is that if this industry is to survive into the future, then it is going to take and immense effort from the government and the industry role players to ensure that all the good work done is not destroyed in as short a time as it was set-up.

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Glossary of Terms

BoTT	Board of Trade and Tariffs
CCIG	Catalytic Converter Interest Group
CKD	Completely Knocked Down
Canner	Company that assembles catalytic converters
Coater	Company that coats substrates with precious metals
DTI	Department of Trade and Industry
GM	General Motors
FOB	Free On Board
IRCC	Import Rebate Credit Certificates
MBL	Masters in Business Leadership
MIDP	Motor Industry Development Programme
NAACAM	National Association of Automotive Component and Allied Manufacturers
NAAMSA	National Association of Automobile Manufacturers of South Africa
OEM	Original Equipment Manufacturers
PAA	Productive Asset Allowances
PGM	Platinum Group Metals
PWC	PricewaterHouse Coopers
SBL	School of Business Leadership
SMME	Small Medium and Micro Enterprises
WTO	World Trade Organisation

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Chapter 1

Introduction

"The farther back you can look,
the farther forward you are likely to see"
Winston Churchill

1.01 Terms of reference

This Research Report is presented in partial fulfilment of the requirements of the Masters of Business Leadership Degree at the Graduate School of Business Leadership of the University of South Africa. Professor Viola Makin of the SBL was assigned as the sponsor for this Research Report.

1.02 Objectives of the Research

The primary objective of this research is to assess whether the success and continued sustainability of the Catalytic Converter industry is critically dependent on a legislative regime.

The secondary objectives of the research are to:

- Document the origins, history, growth and current structure of the industry
- Look into the impact that the rapid growth of the South African catalytic converter industry has had on the international catalytic converter industry.
- Detail the short and long term prospects of the industry as seen by all the relevant role players, including identifying the risks facing the industry from, amongst others, legislative changes.
- Determine the key factors required to ensure the industries on going success and long term sustainability.

1.03 Background to area of study

The catalytic converter industry is one of the newest and most dynamic additions to the motor vehicle component industry in South Africa.

A Catalytic Converter is a small stainless steel fixture in the exhaust system of a motor vehicle, in addition to the mufflers. The unit contains a ceramic substrate coated with an oxide coating and various platinum group precious metals. Its main function is to convert the noxious gasses, produced by engines using unleaded petrol, into less harmful gasses (PES Brochure, 1999).

The whole South African catalytic converter industry was conceived due to the introduction of incentive schemes like the Motor Industry Development Programme (MIDP) by the South African government (Interview analysis, Table 1). In accordance

with the MIDP rules, any entity exporting a product can obtain permission from the South African government, to deduct a certain percentage of the local content of the sales price of that product from its import duties on other products (PWC Brochure, 1999).

The main reason for this particular component being chosen was that:

- it is relatively small
- it is expensive for its size
- and a large amount of the expensive raw materials are found locally. These raw materials include stainless steel and precious metals in the form of rhodium, palladium and platinum (Interview analysis, Table 1).

All the above factors fell perfectly into place with the MIDP rules in that it allowed the Original Equipment Manufacturers (OEMs) to gain the maximum advantage with the least amount of effort. The industry has in fact made such an impact that the government has paid particular attention to this industry when reviewing the rules of the MIDP (BoTT, 1999).

While on the one hand the Government has been concerned with the amount of advantage that the catalytic converter industry has been taking from the MIDP it has also had to recognise the positive local and international capital investment and job opportunities that it has generated (Infocom, Sept 1999).

The amount of investment and activity in the local industry has been to such an extent that it has resulted in the establishment of the Catalytic Converter Interest Group (CCIG) to enable the industry to represent itself to Government with a united voice (CCIG Correspondence, 1992 – 2000).

1.04 Research Strategy and Scope

The intention of the Research Report is to be very focused on the industry in question. The strategy would therefore not be to look for possible impacts on other areas of the economy or the possibility of a replication of this industry growth in another field.

The intention is to give a better understanding to those who do not know anything about the catalytic converter industry and record the views of the relevant role players as regards the future growth and structure of this industry. The research should add to the body of knowledge regarding the catalytic converter industry. This knowledge could be of value to law makers and industrial incentive bodies in formulating future policies and strategies.

Who will benefit from this Research Report :

- People who would like to know more about the industry due to it being repeatedly in the news and often used as an example when ever anyone starts talking about getting involved in a new industry or venture.
- Chief executive officer's and executive management in the industry who will get access to the documented views of their colleagues in the industry.

- Department of Trade and Industry officials and other policy makers, whose actions and decisions will certainly have a bearing on the future of this industry.

Due to the fact that this industry is relatively young there is very little information in textbooks. Factual research for this project was therefore done by taking extracts from newspaper and magazine articles to supplement the information gathered during the interviews.

1.05 Approach followed

The approach taken in completing this Research Report was as follows:

- Research into the body of knowledge on the catalytic converter industry was completed by:
    - Collecting and reading articles in newspapers and periodicals.
    - Information supplied during interviews.
- Research into the details of the MIDP was completed from government documentation and informational brochures.
- Structured interviews and questionnaire responses from top management of South African catalytic converter companies.
- Structured interviews and questionnaire responses from prominent members of the Catalytic Converter Interest Group.
- Structured interviews and questionnaire responses from representatives of other relevant bodies in the industry.

1.06 Structure of the Research Report

The chapter structure of this Research Report is as follows:

Chapter 1 - Introduction

This chapter not only details the objectives of the research but the approach to and structure of the report as well.

Chapter 2 - Motor Industry Development Programme

In this section the MIDP is described with specific reference to the sections pertaining to the Catalytic Converter Industry. The chapter will describe the origins, structure and rebate procedures of the MIDP scheme.

Chapter 3 - The Catalytic Converter

This section gives the readers who have not been exposed to a catalytic converter before, a detailed explanation of what a catalytic converter is, what it does, and what it is made up of.

Chapter 4 - The South African Catalytic Converter Industry

The history, development and current structure of the industry is detailed in this chapter as it is only with a clear understanding of the industry's origins that an informed look at its future prospects are possible. Information obtained from articles and discussions with people in the industry was the main source of information for this chapter.

Chapter 5 - A Global perspective

How the South African catalytic converter industry fits into the global market is detailed here with special attention paid to how this rather unique industry functions. It is also clearly stated why South Africa has such a large presence in the international market. The impact of South Africa on the global market will be analysed as well as what the global market has done for the South African economy and business ethic.

Chapter 6 - Research Procedure followed

This chapter documents in detail the method followed in gathering the data needed for the completion of the thesis. The rationale behind the preparation of the questionnaire and the methods used to ensure its correct completion are also laid out. The method of selecting the interview respondents and who they were is also included here.

Chapter 7 - Discussion on Research Findings

The results of the interviews are discussed here in such a manner that one is able to use the information to gain an understanding of where the major role players feel that the industry is heading.

The emphasis in this chapter is on the analysis and interpretation of the information obtained through the questionnaires and structured interviews. The strengths and weaknesses of the different suggestions are also documented here.

Chapter 8 - Conclusions and Recommendations

The report concludes by assessing the information and interpretation thereof to see if there is any consensus among those involved in the industry as to exactly where it is headed and what role it will have in the future of the motor component industry and the South African economy as a whole.

Specifically the research will attempt to conclude whether the now well founded industry could be sustainable even without the benefits of the MIDP and or other legislative advantages.

Chapter 2

The Motor Industry Development Programme

"Its's a good idea to obey
all rules when you're young
just so you'll have the strength
to break them when you're old"
Mark Twain

2.01 Introduction

Due to the large amount of influence the government incentive programmes have had on the catalytic converter industry it would be impossible to understand the history and future challenges that face this industry without first having a more detailed look at these government incentive programmes and in particular the Motor Industry Development Programme (MIDP) (Infocom, July 2000).

The information in this section was extracted from:

- The Motor Industry Task Forces report on the MIDP dated 1994
- An Introduction to the MIDP by PriceWaterhouseCoopers
- Letters from the Catalytic Converter Interest Group to the Department of Trade and Industry (DTI)
- Government Gazett No. 20671 dated 3 December 1999
- Rules of the MIDP as release by the DTI

- The Mid Term review media release dated June 2000 as supplied by National Association of Automotive Component and Allied Manufacturers
- Articles from Car Today September 2000 on the mid term review

2.02 Background to the MIDP

The motor industry development program was implemented by the South African Government in September 1995. It replaced the Phase VI programme which had been the previous export incentive programme of the Government. To fully understand where the MIDP originated, from a South African government policy point of view, it is interesting to trace the different phases of the local content programme as it has developed in South Africa (GLS Overview, 1994).

Phase I

The local content programme for passenger cars commenced in March 1962 and required a local content level of 45 percent by mass per motor vehicle to enable relief from import duties to be available to the OEM. A basic excise duty calculated on the vehicle mass was applied and this duty was rebated/reduced until zero duty was registered at he achievement of the 45 percent local content target (GLS Overview, 1994).

Phase II

This phase required the local content level to rise to 55 percent by end 1969 (GLS Overview, 1994).

Phase III

This phase commenced in January 1971 and raised the local content level once again, on an annual basis, to get it from the 55 percent of phase II to 66 percent by the end of 1976 (GLS Overview, 1994).

Phase IV

This was a standstill period termed Phase IV and continued it through to the end of 1979. During this period light commercial vehicles and minibuses became part of the local content programme and penalties on those manufacturers not achieving the desired local content levels became more severe (GLS Overview, 1994).

Phase V

This commenced on January 01, 1980 and continued until the end of May 1989. The minimum level of 66 percent local content by vehicle mass was maintained. A major change now introduced for the first time was that credits were extended on achievements exceeding 66 percent local content. At the end of 1981 light and heavy trucks became involved in separate local content programme commencing initially with engines followed by transmissions and axles (GLS Overview, 1994).

Phase VI

The commencement date for this phase was 1 June 1989. The programme covered all motor vehicles i.e. passenger cars including station wagons light and medium commercial

vehicles and buses. For the first time "Value" became the basis on which incentives were calculated (GLS Overview, 1994).

The local content percentage target, starting at a 55 percent level, was based on overall local content "value" achievement of the total vehicle sales per excise quarter was now introduced. Frequent increases within a short period of time resulted in the planned maximum target level of 75 percent being reached and becoming effective as from September 1991 (GLS Overview, 1994).

Local content levels were determined, broadly speaking, by deducting the total net foreign exchange usage (i.e. gross foreign exchange usage of production imports minus foreign exchange earnings through exports) recorded during a specific excise quarter, from total vehicle sales turnover achieved during the same excise quarter.

Current duty level was 37.5 percent of vehicle selling price, or dealer billing price, and a rebate amounting to 50 percent of the local content value achievement is allowed as a deduction against the initially calculated duty liabilities.

Local content levels under the minimum level of 55 percent do not earn any rebates. However, the minimum level can include foreign exchange earnings through exports provided actual local content value represents at least 50 points of the 55 minimum percentage points.

Foreign currency payments to be accounted for in respect of imports of production materials and components as well as imports of model related tooling had to be accounted for. Payments for royalties, licence fees and engineering development costs etc are also to be accounted for as foreign exchange usage.

Payments for imported parts and accessories and foreign currency payments for ocean/air freight and insurance were not part of foreign exchange liabilities along with consumables used in production and petroleum.

Deemed local content was also used for the first time with components with less than 25 percent imported content considered 100 percent local for a temporary period until 30 November 1989. As of 1 December 1989 the full foreign exchange usage had to be accounted for. engines, gearboxes and imported coated steel were initially deemed to be 100 percent local content. This facility was however withdrawn during 1993 (GLS Overview, 1994).

Local suppliers had to report the imported value or foreign exchange usage to the OEMs. A "Certificate of foreign exchange usage", called a DA 190 form, was issued at the time of delivery. OEM's had to summarise these foreign exchange levels for inclusion as a liability in the quarterly excise accounts.

Motor Industry Development Program

The new programme, on the other hand, was based on the Australian Automotive Industry Facilitation Scheme, which had run very successfully in that country for a number of years and was focused on promoting exports (PWC Brochure, 1999).

This programme was incorporated into the Custom and Excise Legislation. According to this legislation both the motor manufacturers as well as any component manufacturers, like the catalytic converter manufacturers, that would be involved with the exporting of goods under this programme, had to register with the Department of Trade and Industry.

2.03 Objectives of MIDP

The programme had to fall into line with the Government's overall strategy for the economy as a whole but the main objectives of the MIDP, as an important part of this overall package, was to :

- Provide affordable vehicles of a high quality to the local market.

  The participating original equipment manufacturers could now do this due to their ability to reduce the high import duties on imported cars and components with the rebates from exports. This was therefore ensuring that the duties were not passed straight onto the final customer.

- Provide sustainable and longterm employment.

  The high unemployment rate in South Africa makes this an objective of just about any scheme but the potential for new business was one of the key elements of the MIDP that made it so attractive to all.

- Improve the gross domestic product and trade balance through improved global integration.

  The Government identified the need for closer ties and greater input from the more developed countries and by exporting and greater inter-related trade this would be possible (PWC Brochure, 1999).

These broad objectives were a large target to set for just one programme, but the government was convinced that the MIDP had all the needed elements to succeed.

2.04 How MIDP achieves its objectives

The above objectives set for the MIDP are achieved to a greater or lesser extent by :

- Increasing production volumes through exports and model rationalisation
- Price reductions through improved economies of scale;
- Encouraging foreign investment for the expansion, upgrading and modernisation of existing local facilities;
- Attracting new investment from international industry role players;
- Extending the local model range due to the affordability of imported fully build up units (PWC Brochure, 1999).

The motor manufacturers are now able to do the above as they can now not only deduct all normal rebates on imported components but the face value of the Import Rebate Credit Certificates (IRCC's) from the custom duties payable on imported component and fully built up units as well.

2.05 Import Rebate Credit Certificates (IRCC's)

Once the Department of Trade and Industry has received and independently audited confirmation that an exporter has repatriated foreign currency for a certain invoice and converted that currency into South African Rands, then they will issue an IRCC. The IRCC has become an extremely important document as it is the manner in which the benefits from the MIDP are controlled.

The face value of an IRCC is the benefit earned by the exporter once certain specific criteria have been met. The benefit is in fact the net foreign currency earned. To arrive at the net foreign currency earned the exporter will take the value of the foreign currency earned at a Free On Board (FOB) level and deduct from that the foreign currency used, also at a F.O.B. level, in production of that item. These foreign expenses are either incurred directly by the exporter or declared, through the use of DA 190 declarations, by all the different organisations involved in the supply chain to the supplier. Some foreign costs like commissions and marketing costs must also be taken into account (PWC Brochure, 1999).

Hypothetical calculation of the face value of an IRCC

	Rands	
Export Earnings (F.O.B. value)	150 000	
Less Foreign Currency Usage (F.O.B. value)		
Directly incurred by exporter	(10 000)	
Declared to exporter by suppliers	(35 000)	DA190 used for this
Less other foreign costs	(5 000)	
Face Value of IRCC	100 000	

(PWC Brochure, 1999)

One area that is specific to the catalytic converter industry is that there is a deemed imported content for the precious metals that are used in the catalytic converter's manufacture. This is one of the ways in which the government is paying special attention to the converter industry to ensure that it does not take excessive advantage from the programme.

As detailed in the table below it can be seen how the motor industry development programme is structured through to its conclusion in 2007. This is after the release of the mid term review in the middle of 2000.

YEAR	Qualifying PGM Percentage	Overall qualifying Percentage	Rebate Percentage
1999	90%	100%	37.5%
2000	80%	100%	35.0%
2001	60%	100%	32.5%
2002	50%	100%	30.0%
2003	40%	94%	29.0%
2004	40%	88%	28.0%
2005	40%	82%	27.0%
2006	40%	76%	26.0%
2007	40%	70%	25.0%

(NAACAM Press Release, 2000)

The major elements of the program that impact on the catalytic converter industry are:

- The decrease in qualifying percentage of precious metal,
- The decrease in overall qualifying value and
- The reduction in the actual percentage used to calculate the rebate.

These first two percentages are used in the calculation of the local content value on the IRCC at an F.O.B. level, as explained above. This local content figure is then multiplied by the rebate percentage for that relevant year, in which the IRCC is used, to obtain the final rebate amount that can be deducted from the import duties.

2.06 Final Registration of IRCCs

Once the above calculation has been done the application to use the export to gain an IRCC must be made within one year of original export of the item. If the claim is not made within this time then that particular export becomes time barred and no advantage will be gained from this particular export.

The main reasons for an export becoming time barred is that:

- The proceeds from that export must be repatriated into South Africa and converted into South African Rands before any such application can be made.
- Only one claim may be made per export so although some currency may be repatriated immediately it cannot be claimed until all of the currency has been repatriated for that particular export without losing some benefit.

With some customers being a long distance away and the fluctuations in world demand it does happen that part of an export shipment may still be unpaid for eleven or so months later. It is then up to the exporter to claim what ever can be claimed at that time.

When a long period has elapsed since the date of invoice then it can happen that the goods are finally sold to the end customer at a different price to the one at which it was exported. This could be due to an exporter giving a discount to sell the goods or due to a normal price increase or decrease in the normal business cycle. When this happens it is

up to the exporter to issue the Department of Trade and Industry a voucher of correction. This voucher of correction is the only way in which an exporter can make a change to an export invoice which is the main control document for the eligibility of claim from the Governments point of view.

2.07 Trading in IRCC's

These IRCC's, once registered, may be transferred to another importer or sold between participants. Many catalytic converter manufacturers transfer the IRCC's to their associated Original Equipment Manufacturer. An example of this is seen with some wholly owned subsidiary canners getting no advantage at all out of IRCCs as their parent company uses it all with out compensating the subsidiary in any way. It is therefore possible that the entity earning the certificate may not necessarily gain any direct advantage from it (PWC Brochure, 1999).

There are still a few other restriction to the use of IRCCs. If an IRCC is used for the import of fully built up units then it must be reduced by 25 percent of its face value when used. This however is mainly of significance to the OEM that uses the certificate and not very important to the component manufacturer including catalytic converter manufacturers.

2.08 Conclusion

It is clear from the above how important the MIDP has been to the South African economy as a whole and the catalytic converter industry in particular. Just as evident, however, is the threat that it poses to the industry as it gets phased out over the remaining years up to 2007 in line with the present plan.

The mere fact that the South African catalytic converter industry exists at all bears testimony to the success of the MIDP. The value of the international exposure and foreign direct investment that has been drawn to this country as a result of the MIDP cannot be overstated. The question remains however if there is anything in the future that will allow this young industry to continue to blossom.

Chapter 3

The Catalytic Converter

"Everything should be made as simple as possible but not simpler."
Albert Einstein

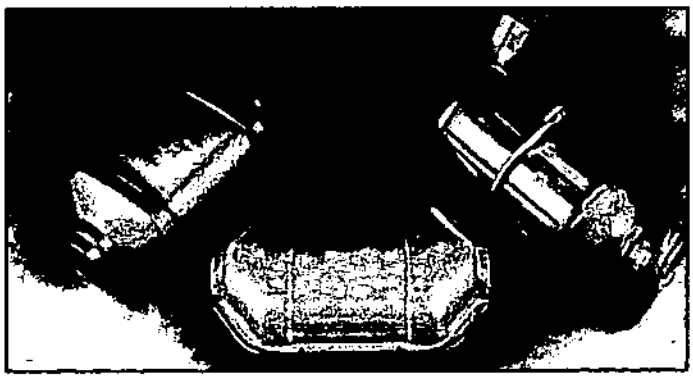
3.01 Introduction

The catalytic converter is not a well known product in South Africa due to the fact that it is not used on very many cars on the local market. A thorough knowledge of the product itself is helpful in understanding the reasons for this industry's rise in South Africa as well as its long term prospects.

Information in this chapter is taken from:

- An information brochure on catalytic converters used by Precision Exhaust Systems (Pty) Ltd.
- Observations of the catalytic converter itself.

Picture 1: Examples of catalytic converters, made in Port Elizabeth, for export to Europe

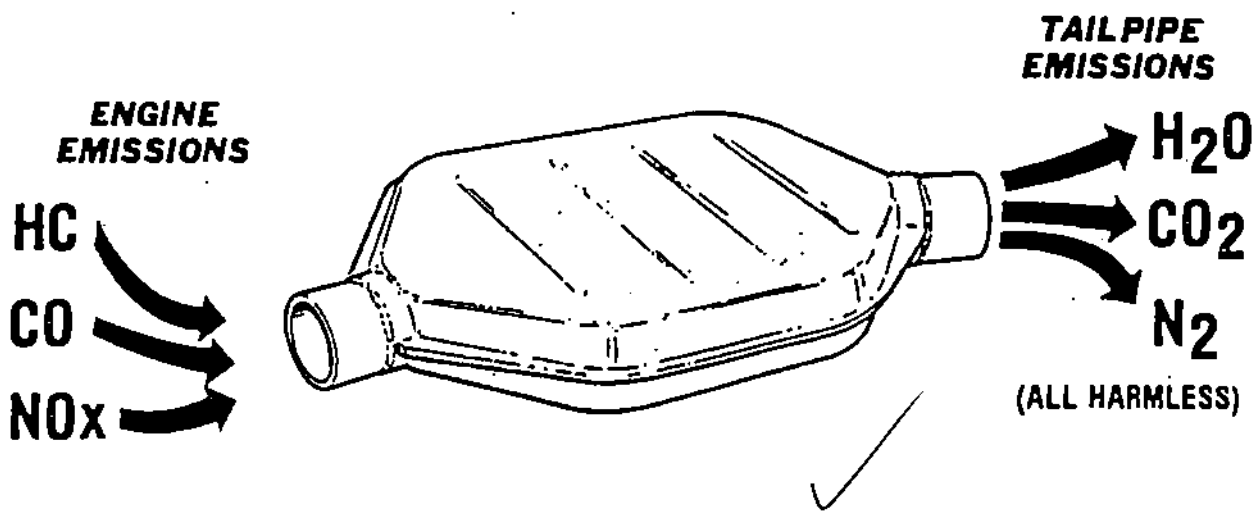


3.02 The need for a catalytic converter

When an internal combustion engine runs it produces a number of exhaust gases, some safe, some not so safe. This is especially true when lead free petrol is used.

If the car's exhaust pipe were to run at a very high temperature all the time, high being more than 1000°C, then the unsafe gases would be changed into normal safe gases on their own.(PES Brochure, 1999)

This however is not the case. The exhaust is much cooler than 1000°C and so the exhaust gases produced by the engine are not changed into safe gases. This is where the catalytic converter steps in and allows the noxious gases to change into non-noxious gases at a much lower temperature of between 250°C to 850°C (PES Brochure, 1999).

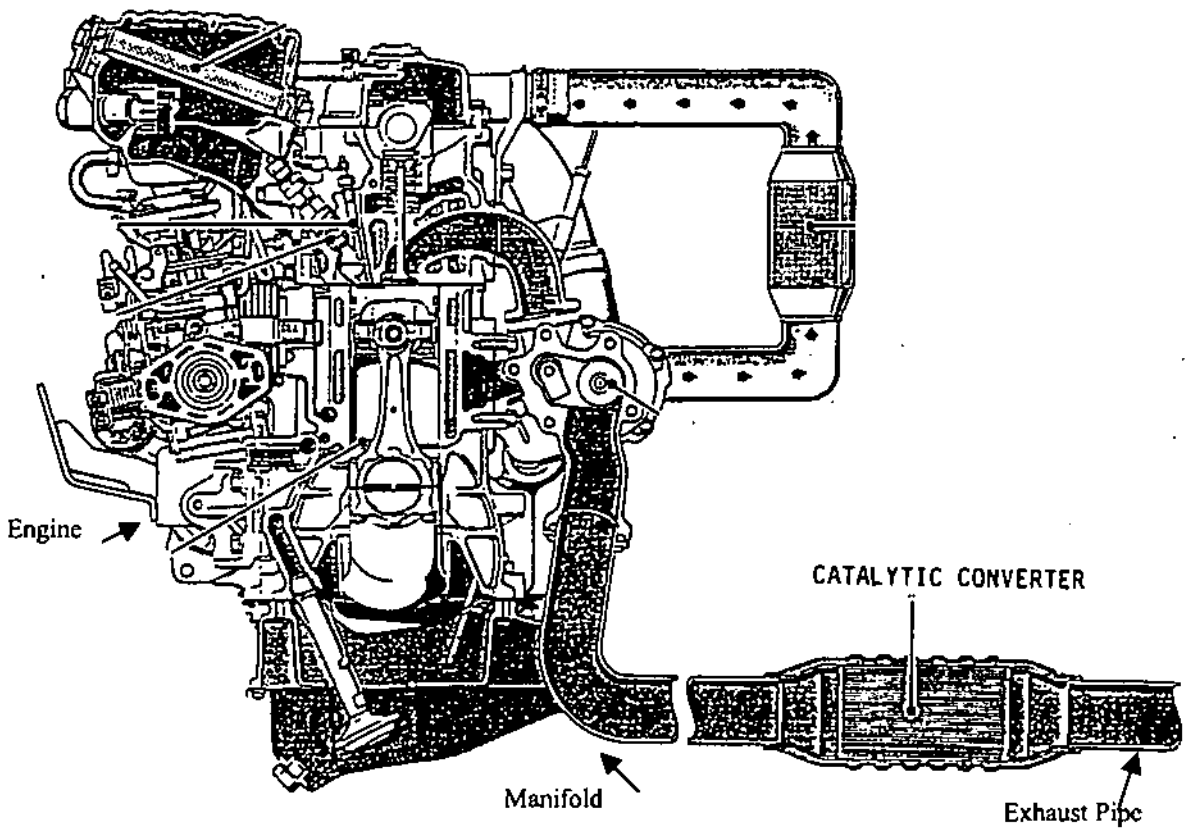


(PES Brochure, 1999)

3.03 Location of a catalytic converter

The converter is fitted as close to the exhaust manifold as possible and is coupled into the exhaust system so that:

- The converter will operate at as high a temperature as possible to be as efficient as possible.
- All the exhaust gases must pass through the converter.



(PES Brochure, 1999)

3.04 Catalytic Converters in South Africa

At the moment there is no law in South Africa that compels the use of converters and lead free petrol has not been available in here for a long time so converters are not very widely used. Petrol companies do now produce lead free petrol in South Africa however and this will allow car manufacturers to introduce engines that can run well on lead free petrol and as a result will need a catalytic converter.

This will only happen on a large scale however when a law has been passed as this move does add to the price of the car quite significantly. Such laws have already been passed in Europe, England, United States, Japan and many other countries. It is normal for South Africa to follow international trends on these types of issues and it is expected that this environmental legislation will be phased in over the next few years.

It is not expected that the South African market will have a large impact on the local industry as the volumes are extremely small in comparison to the markets that are supplied in Europe and elsewhere in the world. In addition to this is the fact that each OEM in South Africa has its own associated manufacturer so the small volume will be divided up into even smaller batches among the many role players in the local market.

3.05 Durability of the converter

The materials and precious metals in a converter that cause the gasses to change from noxious to non-noxious gasses do not get used up in this process, they simply cause the change without being reduced themselves so the converter has an almost limitless life.

The converter is also made from stainless steel so it will not rust easily. The converter should therefore last for at least 10 years (PES Brochure, 1999).

3.06 Components of a Catalytic Converter

- **The shells**

  These form the outer casing and are made from stainless steel. Their function is to house and protect the working parts of the converter.

- **The End Cones**

  These form the inner support for the ceramic monolith and are made from stainless steel. Their function is to support the monolith and funnel the exhaust gases in and out of the converter.

- **Ceramic Monolith**

  This is the heart of the converter and is made from extruded cordierite. Its function is to carry the precious metals in such a way that the exhaust gases get maximum exposure as they pass over them and thus change to become harmless gases.

- **Thin Insulator**

  This is wrapped around the monolith and is made from a material with a vermiculite and mica base. Its function is to :

  - seal off the gap between the end cones and the monolith so that all of the exhaust gases go through the monolith,
  - to keep the outside of the converter cool,

- to protect the monolith from being damaged by vibration.

- **The Tubes and Flange**

  The tubes are made from stainless steel. The flange is made from mild steel. The function of these parts is to connect the converter to the exhaust pipe on the one end and the manifold on the other.

- **Precious Metal**

  Various combinations of platinum, rhodium and palladium are used depending on the vehicle application. The function of the metals is to act as a catalyst and convert the harmful exhaust gases into safe gases.

3.07 Materials used

- **409 Stainless Steel**

  This stainless steel is made in South Africa

  Most of the metal parts for the converters, except the flange are made from 409 stainless steel. 409 is called a ferritic stainless steel. That means it has a lot of normal mild steel in it and it can therefore still be magnetised.

  A ferritic stainless steel is the lowest grade of stainless steel available but because it works at high temperatures in the exhaust system it does not rust. If it is left out

in the rain it will eventually rust. It is thus not a true stainless steel (PES Brochure, 1999).

- **The Insulators**

  These insulators are imported from the United States of America.

  These are made from a mica based material which has the unique property of expanding permanently when it is heated for the first time. This means that when the engine of a brand new car fitted with a catalytic converter is started up the insulators are heated up and they expand.

  This does two things:-

  - The insulators hold the ceramic monolith firmly in place and prevent it from breaking.
  - When the insulators expand they seal off the monolith and ensure that all of the exhaust gases pass through the monolith (PES Brochure, 1999).

- **The precious metals**

  These precious metals are mined in South Africa and are the major contributor to the local content of the converter due to their high prices in comparison with the other components of the converter.

Platinum, palladium and rhodium are used as catalysts. The metals are very expensive and so an absolute minimum quantity is used for a converter. Below is an example of the amount of metal used per converter.

Platinum = 2,00 grams.

Rhodium = 0,30 grams.

Palladium = 6.00 grams

(PES Brochure, 1999)

The coating process is extremely complicated making it only possible for the metals to be recovered by a special process. Only one factory in Germany is able to recover the precious metals from the coated monolith. ✓

- **The coating of the monolith with Platinum, Rhodium and Palladium**

  This is done in South Africa mainly by companies that are South African branches of large international corporates that have the technology to perform this function.

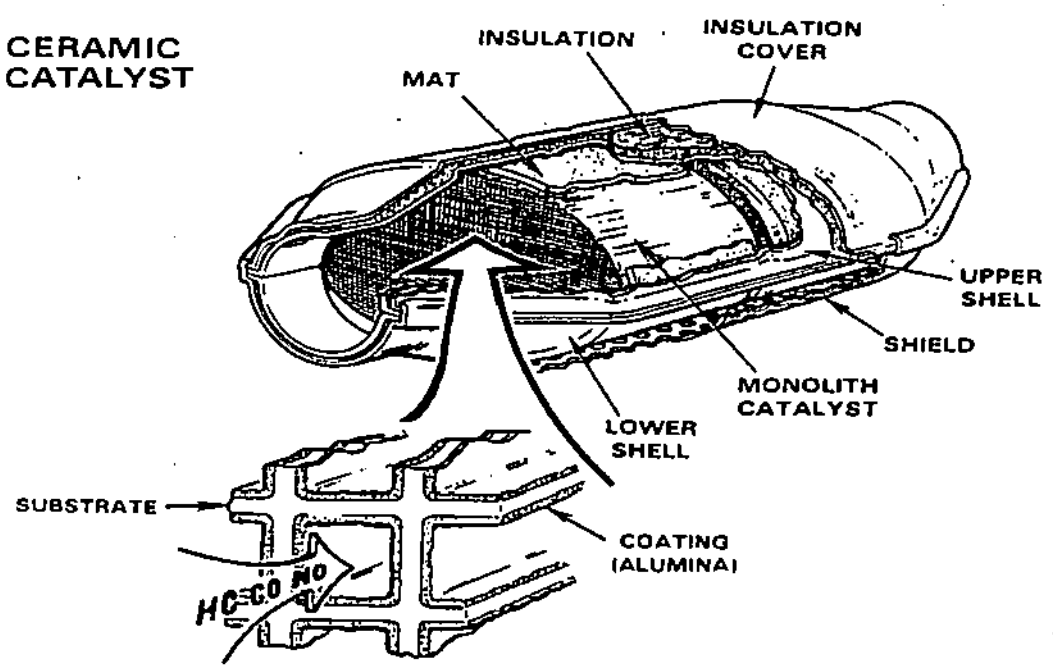
  It is important that all of the exhaust gases come into contact with the precious metals so the larger the surface area the metals are spread over, the better the conversion process is.

  To achieve this firstly a ceramic monolith is used to carry the metal. If one looks at the monolith it is constructed with as many little cells as possible. Ther are in fact 62 squares for every square centimeter and the walls between the squares are only 0,15 mm thick (PES Brochure, 1999).

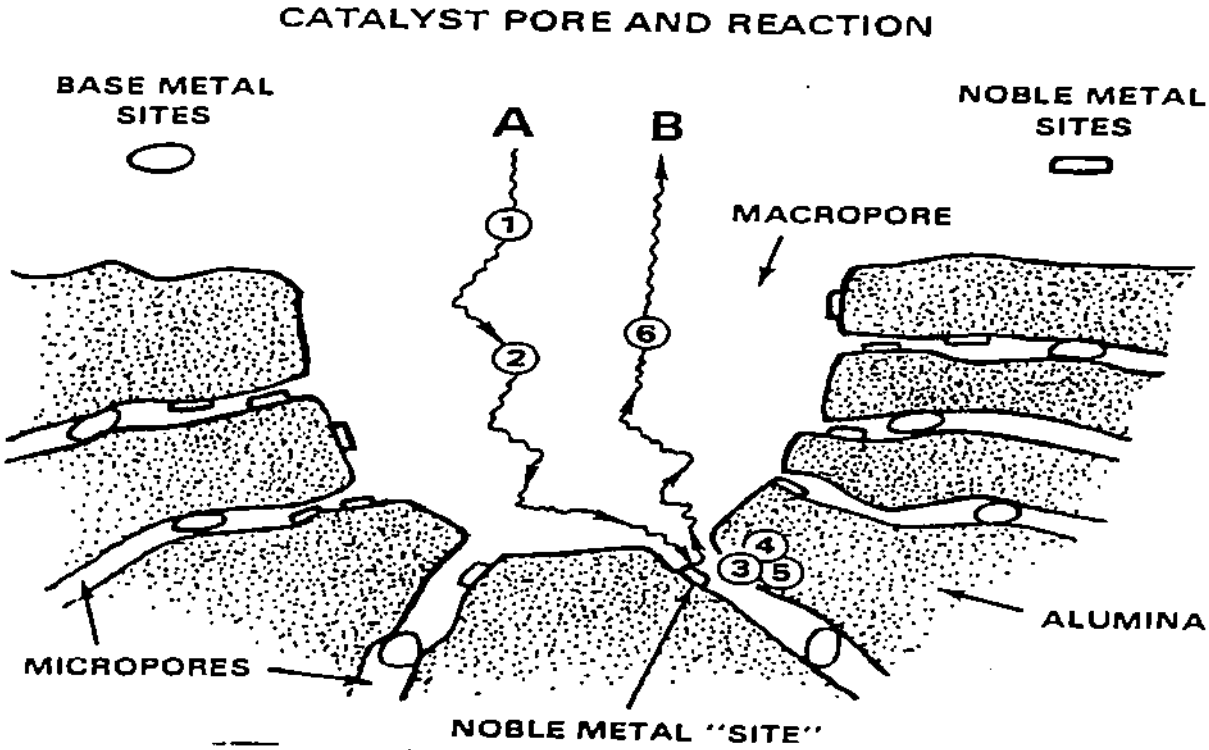
Even this is not nearly enough. To increase this surface area the coating supplier puts on what is called a "wash coat". This wash coat is mainly made from aluminium oxide which has two properties.

- It is stable at high temperatures.
- It has a very porous structure that increases the surface area of the monolith.

Once the monolith has its wash coat on the surface area is 45000 square metres or equal to about ten rugby fields. It basically looks like this:



.(PES Brochure, 1999)



(PES Brochure, 1999)

The wash coat absorbs water well, so to get the Platinum, Rhodium and Palladium spread evenly, the metals are converted into their salt state. They are then dissolved in a water solution and the monolith is dipped into this solution.

The wash coat absorbs the metal solution. It is then put into an oven to convert the metals back into their original form but now the metals are spread very thinly over the entire surface on the monolith.

3.08 Work done by the converter

Major gases produced by the engine are:

Hydrocarbons	HC *
Carbon Monoxide	CO *
Oxygen	O^2
Nitrogen	N^2
Water Vapour	H^2O
Hydrogen	H^2
Sulphur Dioxide	SO^2
Oxides of Nitrogen	NO *

*HC, CO and NO are the gases that are harmful (PES Brochure, 1999).

These gases are changed when they pass over the precious metal at a temperature above 250°C as detailed below. This temperature of 250°C is called the converter light off and it is very important that the converter reaches this temperature as quickly as possible to ensure that it starts to function properly (PES Brochure, 1999).

Hydrocarbons	HC	Changes to	Water	H^2O.
Carbon Monoxide	CO	Changes to	Carbon Dioxide	CO^2.
Oxides of Nitrogen	NO	Changes to	Nitrogen	N^2

(PES Brochure, 1999)

3.09 Conclusion

The make up of the catalytic converter and how it functions allows for a better understanding of exactly why this particular industry was chosen to become so important in the South African component and motor industry despite it not being used very much locally.

The catalytic converter is a relatively new commercial product and there is an increasing global demand. While other component supply sources are well established internationally, the increasing demand for catalytic converters make it a suitable product to source from areas where best commercial value can be gained. Therefore, even though the product is not used in South Africa, a very viable industry segment has established itself due to the high value, low bulk manufacturing process using both stainless steel and precious metals which are readily available in South Africa.

All local OEM's are importing components in the form of Completely Knocked Down (CKD) stocks. All these OEM's also have international parent companies requiring catalytic converters from some source. The opportunity therefore presented itself for these OEM's to locate subsidary companies or to form alliances with other companies in South Africa to provide catalytic converters to the international parent companies, while at the same time creating import credits for the importing of components and even fully built up units.

Chapter 4

South African Catalytic Converter Industry

"You can't build a reputation on what you're going to do."
Henry Ford

4.01 Introduction

To fully understand the challenges that face the South African Catalytic Converter industry it is important to know where it has originated from and how it has developed over its relatively short history. It is only once one has done this and brought ones knowledge of the Motor Industry Development Program to bear at the same time that one is in a position to look into the future. It is also important to remember that the future is not only up to the end of 2007 and the MIDP but into the years there after as well.

Due to the fact that the local industry is relatively young the information in this chapter was gleamed form a number of different sources including:

- Articles from the Eastern Province Herald
- Articles from the Eastern Cape Weekend Newspaper

- Infocom the official magazine of the Port Elizabeth Regional Chamber of Commerce and Industry.
- The SMME Tabloid
- Columbus Contact the promotional brochure for Columbus Stainless Steel
- Car Today Magazine
- Documentation of the Catalytic Converter Interest Group
- Information obtained during interviews with industry Role Players.

4.02 Mercedes-Benz takes the initiative

The Catalytic Converter Industry arose directly out of the government's development schemes that went through a change in focus and form in the late 1980s and early 1990s. The most important of these changes was the inclusion of export credits into these schemes for the first time (CCIG, 1993).

Daimler-Benz, the German auto giant, were the first to act when they requested Mercedes-Benz South Africa (MBSA) to investigate the possibility of supplying them with catalytic converters in mid 1989. MBSA approached the South African Government and requested them to include the local manufacture of catalytic converters in the Phase VI local content programme for the motor vehicle industry. Approval for this was obtained from the Minister of Trade Industry and Tourism in November 1989.

MBSA then started working with Braun Engineering, located in Butterworth Transkei to take advantage of border industry concessions from the Government. Braun Engineering were already supplying exhausts to MBSA and were looking for products to expand and diversify their product range (CCIG, 1993). Due to the fact that all other component manufacturers were enjoying a 50c to the Rand rebate for exports under this programme it was assumed that the same would be available to the catalytic converter industry but this was never properly and clearly defined (CCIG, 1993).

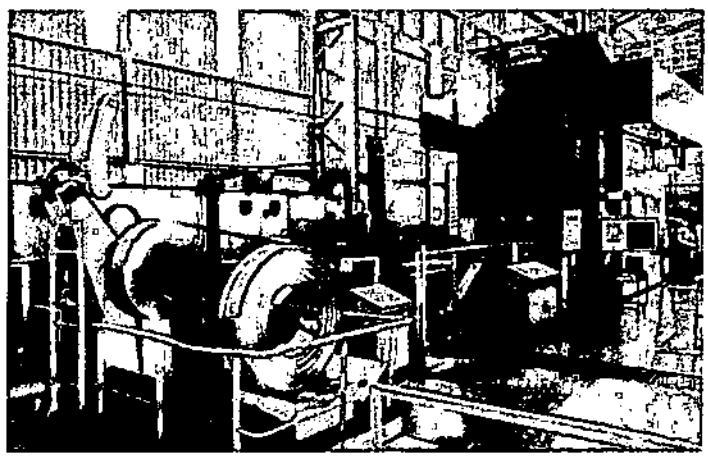
A second company, Autocat was founded in late 1989. It set-up operations in Port Elizabeth and had started production by April 1990. It was established to produce catalytic converters for MBSA as well. It manufactured under license to Eberspacher, in Germany, who later became its sole shareholder. MBSA also approached Degussa AG, a supplier of coated monoliths, to consider setting up a local coating operation to supply Autocat. Degussa agreed to this, but only once they had received very positive feed back from other OEMs that expressed interest in supporting such an investment. It now appeared economically viable to set-up a coating plant in South Africa and Degussa erected the first local coating plant next to its carbon black facility, Algorax, in Port Elizabeth in 1990 (CCIG, 1993).

4.03 General Motors / Delta add momentum

Delta Motor Corporation which took over from General Motors (GM) in South Africa when GM left for political reasons, was the next OEM to react. Delta established a

subsidiary called Precision Exhaust Systems in 1990. This company is located in Markman industrial township some 25 kilometres outside Port Elizabeth. It was to supply around 300 000 converters a year to General Motors Europe and it was in full production by November 1991. In this time the company had also installed a 2 000 ton press to press the stainless steel parts needed to construct its converters. They also followed up on their earlier commitment to Algorax and were getting their coated substrates from Algorax conveniently situated only 7 kilometres away from its plant (PES Brochure, 1999).

Picture 2 : 800 ton press at Precision Exhaust Systems, Port Elizabeth



At this stage all the expansion had been in the Eastern Cape. This region had always been the centre of the motor vehicle industry for the country. This was initially due to the fact that the region had:

- Two good harbours
- There was an abundance of affordable labour
- Plenty of reasonably priced land for expansion available
- Well established infrastructure

(Interview analysis, Table 1)

The end result was that the Port Elizabeth / Uitenhage area had become the "Detroit" of South Africa with large plants for Delta / General Motors, Volkswagen and Ford in the area. At the same time Mercedes-Benz had established themselves in the city of East London 300 km to the east of Port Elizabeth, and the site of the second major harbour in the region.

These plants and the resultant component manufacturers that established themselves nearby were in fact the very life of one of the traditionally poorest regions in the country. Some of the other more important component manufacturers included :

- Tyres Continental, Firestone and Good Year
- Batteries Willards Batteries, National Batteries
- Exhausts Bosal, Braun Engineering, Sten
- And many other companies making seats, bumpers and many other components.

4.04 Expansion spreads to other areas and other OEM's

BMW were not far behind Mercedes-Benz and Delta with them arranging Zeuna-Starker, who were already their converter supplier in Germany, to set-up a facility in Bophuthatswana. This once again had other incentive advantages due to its position in a homeland. Along with this move came the associated coater in the form of Johnson-Matthey who opened a local operation in Germiston. Johnson-Matthey had also, like

Degussa, received support form a number of other OEMs as well. All this was completed by early 1992 (CCIG, 1993).

Nissan also joined the action and by April 1992 they were exporting converters to Italy for Fiat. The coating of the substrates was done by Johnson Matthey. Autocat, who had taken over Braun Engineering in Butterworth, were doing the canning in that facility. Around the same time Volkswagen also got involved with Bosal Africa, in Uitenhage, canning monoliths, which had been coated by Algorax, for export to VW Germany (CCIG, 1993).

All this had happened in three short years so that by the end or 1992 the local industry was well established with the following structure and investments.

Company	**Investment** (R Million)	**Employment** (Number Heads)	**Capacity** ('000units p.a.)	**Capacity** (% Utilised)
Coaters				
Algorax	26	44	1 100	65
Johnson Matthey	40	30	1 000	30
Sub Total	66	74	2 100	
Canners				
Autocat	7	45	260	45
Precision Exhaust	15	60	450	67
Zeuna-Starker	14	31	125	48
Bosal Africa	16	80	690	30
Sub Total	52	216	1 525	
Total	118	290	----	----

(CCIG Report, 1993)

On the international front there was a demand for about 40 million converters a year with South Africa already supplying 2% of the world demand without the product even being used in that country.

4.05 The Government takes special interest in the industry

It was not long before the Minister of Trade, Industry and Tourism requested an investigation into the catalytic converter industry to establish what assistance if any it really needed. The recommendations that resulted from this investigation resulted in such a large dispute between this sector of the industry and controlling bodies like NAACAM and NAAMSA that none of the recommendations were accepted at that stage (CCIG, 1993).

If the Government had removed or substantially reduced its assistance to this industry then there would not have been a very bright future for the industry. It had enjoyed a relatively high level of assistance from the government since it had started. This was because the industry was treated the same as all the other component manufacturers while it was producing a product that was far more expensive and with proportionality more local content than other products.

The main reasons for the industry reaping relatively high levels of assistance from the phase VI and Motor Industry Development local content program included :

High Value Component

Due to the component parts and particularly the precious metal content and stainless steel casing the component is high value for relatively low bulk and mass.

Short Lead times to gear up for production

It is an easy product to tool up for and start production. The time lapse involved can be as short as eight months from the decision to go into this market and actual start of production. Industry was as always extremely keen to make use of the new incentives as soon as possible and this industry helped them to get to market in the shortest time.

High Local Inputs

A large amount of the raw material is to be found in South Africa and this is of great importance when trying to take advantage of the MIDP. The platinum group metals (PGMs) and stainless steel make up the bulk of these inputs.

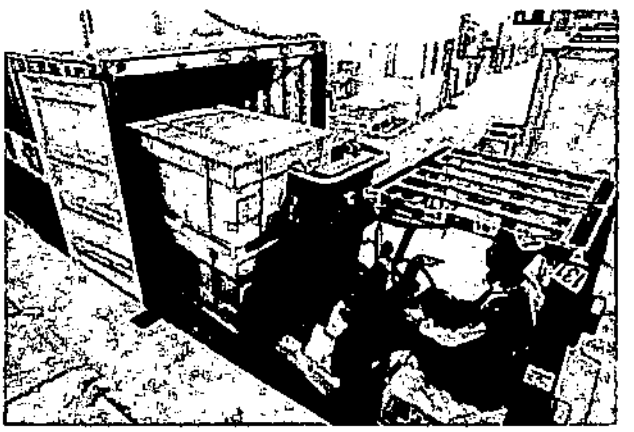
Support from Supply industry

Some of the South African suppliers were very proactive in wanting to process their products further before they were exported. One of the leaders in this was Columbus Stainless Steel who not only wanted to do this for the sake of the South African economy but also because there are a number of anti dumping laws in target countries that disallow the import of raw steel into their countries.

Transportation Costs

Due to the fact that South Africa is a long way from any markets it is of high importance that transport be of as small a contributor as possible to the final cost to customer. Catalytic converters with their relatively high cost for their small size give on of the best ratios of value to transportation of any components made.

Picture 3: Loading catalytic converters into a container for export to Europe



Technology is easily transferable

The Technology involved in the manufacturing of catalytic converters is very easily transferable. This is due to the fact that the coaters are very closely linked to the OEMs so the technology used in that part of the process is very tightly controlled. After that the actual construction of the converter is not very difficult once all the machinery is in place.

OEM driven

The number of converters that are actually made in South Africa on an annual basis is directly the result of the collective decisions of the locally represented OEMs. The OEMs realised that they would need to have access to the advantages of the MIDP

scheme to allow them to remain competitive in the South African market (Interview Analysis, Table 2).

From the above it is clear that the catalytic converter would be a very useful component to be involved in for any OEM needing to import any parts or kits to make up cars. It was also clear that this sector would need to be treated a little different to the other sectors registered to participate in the MIDP.

After a large amount of discussion with and representations to government it was decided that the amount of precious metal to qualify as local would be reduced to avoid this sector taking to much advantage from this program but this only came into effect from 1999 so this sector was treated the same as other sectors for many years.

4.06 South Africa and the World Trade Organisation

Another issue that faced the government and its incentive programs was that South Africa was becoming a member of the World Trade Organisation (WTO) in the early 1990s. Due to this the high levels of assistance that were being enjoyed by a number of industries were no longer acceptable. The Government did however see that it could not just remove all assistance as the fledgling industries, like the catalytic converter industry, would most certainly close down with resultant loss of jobs and confidence for further foreign direct investment (CCIG, 1993).

So it was negotiated with the WTO that the Catalytic Converter Industry would be among the few industries chosen by the South African Government who would still enjoy some sort of advantage or assistance. This was when the reformulation of the incentive schemes started.

Through this reformulation the involvement of export credits that had been used for the first time in the form of the phase VI local content programme became accepted. This initial thinking and trial use of credits was later formalised into the Motor Industry Development Programme in late 1994 and 1995. The origins and development of the MIDP are covered in more detail in Chapter 2 but it was evident to all that catalytic converter industry was the market segment best suited to making use of all the elements of the MIDP as has been pointed out above.

4.07 Further Industry Expansion

In the years that followed the initial injection of capital and the formalising of the MIDP it became apparent to OEMs not involved in this sector that they needed to get involved to remain competitive in the local market. This resulted in other companies moving into South Africa, the more significant of which are mentioned below.

Engelhard South Africa

Engelhard South Africa is part of the American based Engelhard International who have been leaders in the substrate coating business for years. They started production in South

Africa in 1995 with 23 employees working two shifts to make 450 000 units split over two products (EP Herald, Nov 2000).

They have consistently expanded every eighteen months to end up with 130 employees making 47 different products with a plant capacity of 3 million units per year (EP Herald, Nov 2000). A recent decision by them to invest in their own building instead of renting is a significant move from their policy of not owning "Bricks and Mortar." This shows a high level of confidence in the South African industry by this large international player.

HJS Automotive Technologies

This facility was established in May 1997 at a cost of around R 22 Million. It was also situated in Port Elizabeth (Infocom, July 2000).

Tenneco Automotive

Established in Port Elizabeth in May 1998 and by 2000 it had a capacity of 1,8 million converters per year while employing around 450 people. During the middle of 2000 Tenneco won a R2.3Million export contract to Opel in Europe in conjunction with Delta Motor Corporation (CarToday.com. Oct 2000).

Asec Manufacturing

A Detroit based company that is owned by Delphi, which is one of the largest component manufacturers in the world, has invested R30Million and started production in April 2000. Its main focus was to supply Precision Exhaust Systems, a subsidiary of Delta

Motor Corporation, with coated substrates destined for Opel plants in Germany via the Delphi plant in Vileron in Paris where a manifold is first added to the converter (Infocom, Oct 1999).

Ikwezi Automotive

Cuts and supplies matting to wrap monoliths in before they are put into their shells (infocom, Nov 1999).

UMFO/SMI Industrial

This joint venture between Uniformteknik GMBH and SMI Industrial also supplies monolith wraps along with pressed seals to catalytic converter canners (Infocom, Jan 2000).

AP Automotive Systems South Africa

This plant has been set-up in conjunction with Faurcia during June 2000. They will be supplying to Volvo, Peugeot, Ford USA and Mercedes-Benz and when the facility is fully functional it will be supplying about 600 000 units per year (Infocom, Oct 2000).

Corning Incorporated

Perseverance in Port Elizabeth was selected by Corning to be their site in South Africa. This huge international company was approached directly by the South African Department of Trade and Industry and as a result got going in May 2000 (EP Herald, June 2000). The R200 Million spent was another great boost to the Port Elizabeth

metropol and the addition of this great name to those already represented in South Africa has gone a long way to entrenching this industry in South Africa and the Eastern Cape in particular (EP Herald, June 2000).

Corning Incorporated is one of the two biggest suppliers of ceramic substrates in the world. They will be importing green cores, which have been made elsewhere in the world, and then cutting them into required lengths and firing them in special ovens to get them ready for delivery to the South African based coaters (Infocom, July 2000).

The facility will ensure that about 70 people have a job but has also had important spin offs like the R40 million fuel farm set up by Afrox to supply this facility alone (Infocom, June 2000).

Columbus Stainless Steel

In 1989 Middleburg Steel and Alloys, that later became Columbus Stainless steel, in Mpumalanga supplied 500kg of Stainless Steel to Eberspacher on a trial basis. In 1999 the amount of stainless steel supplied to the motor component industry was more than 31 000 tons with forecast growth set to get this to the 80 000 ton mark by 2004 (Columbus Contact, 1st ed 2000).

Columbus has always worked very closely with the canners in helping each other to produce a product that is acceptable to the international market. In so doing it has meant

that South Africa has developed it own specialised steel producer that in turn has assisted other industries in the region.

Amplats

Another company to benefit from this expansion in South Africa was Amplats which is the worlds largest platinum producer. It is to spend R1,3 billion to increase its output at its Rustenburg and Waterval mines (CarToday.com,Sept 2000).

This expansion is also made necessary due to the uncertainty of the supplies from Russia the other world suppliers. This increase demand could not have come at a better time for South Africa as the gold price continued to be under pressure through the middle of 2000 while the platinum group metals were selling at record high prices. This resulted in gold having to take second place to platinum as the most important resource that South Africa has.

Toyota to also get in on the act

It was only announced in July 2000 that Toyota will be joining the catalytic converter party in South Africa during 2001. They will in association with Cataler Corporation invest about R180 million in a plant in Durban. This site was selected due to the fact that Toyota already owns an unused facility in the area that will significantly reduce set-up costs. Once again this plant will employ about 70 people (EP Herald, July 2000).

R11bn deal gives the industry another boost

In late 2000 Renault announced another contract worth R11 billion for the export of catalytic converters to Europe. This contract shows how any OEM who wants to be competitive in the South African market needs to be part of the MIDP (EP Herald, Nov 2000).

The seven years over which this contract lasts will see a total of 14 million converters exported. The companies involved are all already established with capacity to satisfy this volume without further investment but it is still a major source of foreign currency and additional jobs that will result from this. The companies that will be involved are Engelhard, NGK, Corning, Johnson Matthey, Autocat and Faurecia who all have strong ties with the Eastern Cape region of South Afica.

4.08 Other Market Segments to benefit

Apart from the above mentioned companies that have a direct involvement in the converter business there are some other industries that have also benefited.

Fine blanking

This is the art of making strong steel flanges that are used to secure the converter on to the engine. Companies that have benefited here are Iscor who roll the Steel and Fine Blanking (Pty) Ltd that makes the flanges in Gauteng.

Export Boxes

With all the converters being exported the ability to make high quality boxes has been enhanced in South Africa. Companies like Kholer and Pica-Box have made huge strides in this area.

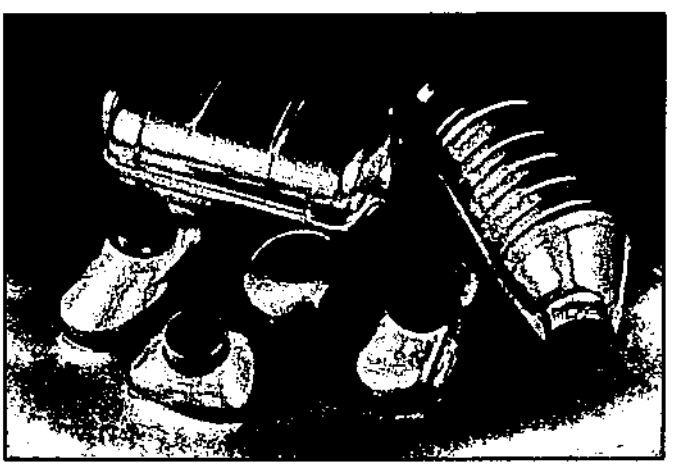
Stainless Steel Tubing

The demand for this component has also been increased due to the development of the catalytic converter industry with suppliers including Sten Precision Components growing quickly and bring large investment in machinery and know-how to this country.

Stainless Steel Stampings

This specialised technique has also been improved with companies like Precision Exhaust Systems and GBG being leaders in this field.

Picture 4 : Stainless steel components for catalytic converters made by Precision Exhausts Systems



Transport and logistics

Once again due to the export nature of the industry and the large distances to the relevant customers there is a large focus on ensuring the product is delivered as quickly as possible. The amount of working capital tied up in these products, due to their high price, also puts pressure on the logistics people to speed up the delivery of product and allow the amount of product in the supply chain to be reduced by being able to depend on delivery times.

4.09 Conclusion

The huge investments and creation of jobs in this industry is something that cannot be underestimated. The fact that it is happening predominantly in one of the poorest parts of the country, 70 % of South Africas production of catalytic converters is in the Eastern Cape, (Infocom, July 2000) is another reason why this initiative is of such significance to the Government and the local people.

Some of the key investment areas have been discussed in this chapter but there are many other industries and services that have gained from this growth but they are far to many to mention individually.

Chapter 5

A Global Perspective

"The secret to success is to learn to accept the impossible, to do without the indespensable and bear the intolerable!"
Nelson Mandela

5.01 Introduction

The Catalytic Converter industry has become very important to the South African economy but it is important to understand how this fits into the international market. It has to be borne in mind that South Africa is producing about eight percent of the world demand for catalytic converters in the year 2000 (SMME Tabloid, June 2000, 3) and while this is one of the biggest world market shares of any manufacturing segment in South Africa it is still a small percentage when looked at from a global perspective.

It is only once one has had a look at how the international market operates that one is able to look at what challenges are faced to ensure that South Africa remains an integral part

of this international industries future. The views of the people interviewed during research for this project formed the basis of the information set out in this chapter.

5.02 The Power of the Original Equipment Manufacturers

The establishment, growth and future prospects of this industry has always been and remains in the hands of the international OEMs who decide where they would like to allocate their volumes of catalytic converters to be made. These decisions are looked at from a global perspective with all regions of the world seen as potential supply areas and the decision going the way of the area that best suites the global company.

When a OEM is planning a new program they very often plan everything from who will make the substrate to who will do the coating before passing it on to be canned by another specially selected supplier. This results in the allocation of business being a very political decision by people at a very high level in the OEM and not one made by a local buyer.

When one realises that the turnover of an OEM like General Motors is the same as the gross domestic product of South Africa then it is easy to see how ensuring that they have a reason to place manufacturing volume in an area far from its final market is essential. It remains a fact that in the end the only reason why an OEM will continue to place business in South Africa, or any other specific area of the global market, is if it makes good economic sense overall.

5.03 Sources of Competitive Advantage for South Africa

Taking the political nature of the international catalytic converter industry into account it is important to analyse the attractiveness of South Africa as a region in which to make catalytic converters. This information was mainly gained from responses of the people in the industry interviewed and the choice of South Africa as a major supplier of catalytic converters is based on the following elements :

Stainless Steel availability and price

The price of local stainless steel has always been linked to the world market price but Columbus Stainless Steel, the South African supplier, has always kept it below the international ruling price. This has been due to the partnership relationship between the industry and Columbus who have always focused on trying to promote the local processing of their steel.

The main reasons for Columbus doing this is two fold.

- Firstly it promotes the local economy
- Secondly they have difficulty in selling their raw product in areas like the USA who have strict anti dumping laws.

The only disadvantage in this area is that Columbus is the only supplier in South Africa (Columbus Contact, 2000).

Over the years Columbus have however become better at making stainless steel which is another way in which they help the competitiveness of the industry by being able to keep the price at a comparatively low level for a good quality steel.

Low Structural and Overhead costs

A number of studies like the international Macdonalds burger comparison, which compares the price of Macdonalds burgers in different countries, have shown clearly that the cost of maintaining the same standard of living in South Africa verses other countries is relatively low. Add to this the fact that inflation has been kept under control in recent years in South Africa and it is plain that this country is seen as good value for money by the international community.

The international companies that have invested money into South Africa have also made extensive and detailed studies of the cost of making converters around the world and been able to agree that the South African costs compare favourably with other areas in the world.

Controlled Interest Rates

With inflation under control South Africa has shown a history of being able to maintain stable interest rates over the long term. This has been seen as an important factor over the years with the Government insisting that at least some of the capital needed to float a new venture be raised locally. Short term interest fluctuations have sometimes dented

confidence but they have always been returned to manageable levels in a reasonable space of time.

The need for the government to ensure that this interest rate control remains is not only due to the initial capital needs of new companies but also due to the long supply chains and high costs of materials used in the catalytic converter industry that causes high interest burdens.

Reduction of Taxation Rates

The South African government has always had as one of its objectives to bring the company taxation rates down to make all locally based companies more competitive. This has been seen in recent years with indications that more reductions could be announced in the next national budget due in early 2001.

Large proportion of worlds needs

As detailed in the development of the local industry the percentage of world production done in South Africa quickly rose to 2% and has since gone to around 10% of the worlds need in just over ten years (East Cape Weekend, June 2000). This is the highest percentage of world supply of any manufactured product from South Africa and is achieved despite South Africa only producing less than one percent of the cars made in the world (NAAMSA, 2000).

All else set aside it can therefore be seen how important this industry is to ensure the government continues to achieve the goals it set out to achieve at the very start of the incentive programs. If this percentage is one of the factors that is enough to make the South African catalytic converter industry sustainable remains to be seen later in this study.

Good Infrastructure

Rail, road, harbour and airport facilities have always been reasonably reliable in South Africa. The focus that apparent drop in delivery of services has enjoyed from government in recent time is a positive indicator that this advantage will not get reduced in any way. Along with this goes other essential services like water and electricity that have always been easily accessible to industry at a reasonable rate.

Low Labour cost

Unskilled and semi-skilled labour has always been abundant in South Africa at a very much lower cost that other areas of the world like Europe which is one of the main markets for the South African industry.

Labour Productivity improvements

Unfortunately low labour cost has also gone hand in hand with low productivity and low interest in such important world issues like quality. This has started to change in the last few years with the government realising the importance of these issues and directing focus onto training and upliftment of workers both directly and indirectly through

different programs like the Skills Development Act, that co-ordinates all training on a national basis, and the other similar initiatives.

Government incentive programs

The governments incentive programmes like the MIDP have always been essential to the OEMs seeing South Africa as a good place to make catalytic converters. Any OEM wanting to be competitive in the South African market has been forced to find some way of reducing the high import duties on parts and kits to make up vehicles let alone completely made up units.

The above factors are all seen as very important, by the industry players, not only as the reason for this industry existing but also as some of the strategic factors that need to be kept in mind as the retention and increase of the world market share is attempted into the future.

5.04 Threats to the South African industry

While South Africa has a number of factors going it way as regards maintaining and growing the catalytic converter industry there are still a number of obstacles that stand in its way and these include the factors detailed below.

Stainless Steel

While South Africa has a reliable supplier of Stainless Steel in Columbus Stainless Steel it remains a problem that there is only one supplier in South Africa. Columbus has developed a large amount over the years with its direct involvement in the catalytic converter industry but it remains a monopoly in the supply of this very important raw material. The use of steel obtained on the international market is also not an option at this stage, due to the loss of local content in the calculation of the MIDP advantage, due to loss of local content in the end product.

As with many monopolistic supplier it is often thought that:

- Research and development could be a little faster and focused on delivering a better product.
- Quality is in need of an elevated status.
- Some unrealistic price increase are pushed towards the customer.

The announcement that there may be another stainless steel supplier locating itself at the Coega Industrial Development site outside Port Elizabeth has been seen as one way in which this area of concern can be addressed.

The end of the MIDP as we know it in 2007 will also change this equation due to the location of a supplier no longer being a major factor.

PGMs at international prices

The fact that platinum group metals makes up about eighty percent of the cost of a converter means that the acquisition of this raw material is very important. South Africa and Russia are the two main source of platinum in the world but with the unreliable nature of the Russian supply in recent times South Africa has been elevated to be the major force in the world.

Despite this dominance there is no special price for PGMs for South African manufacturers due to fact that the metals are mined here. These metals are traded on an internationally regulated market with one world price no matter where the metal is purchased.

The advantage for the South African manufacturers therefore remain once again with the MIDP as the metal mined here contributes in a massive way to the local content of the catalytic converter. The related threats to this industry are therefore clear as the MIDP reduces the allowable portion of PGMs for local content over the next few years before disappearing completely in 2007.

Transportation

Although South Africa makes around 10 percent of the worlds catalytic converter it does not use these products themselves. In addition to this is the fact that South Africa is positioned on the southern most tip of Africa and very far from its main markets for this product in Europe and America.

The high transport cost element of the final converter delivered remains a problem for the South African manufacturer. These high costs are absorbed by the manufacturer at this stage due to there ability to off set them against income generated by the MIDP. This advantage though has a definite life span and the future without the MIDP needs to be looked at in this respect.

High hurdle rate of return

International Corporations demand a better than normal return on their investment due to uncertainty that surrounds not only this country but the whole sub-Saharan area. Disruption of meaningful economic activity in countries like Zimbabwe adds fuel to these demands for higher returns as the perceived risk is higher than other areas in the world.

The South African Government needs to reduce risks and get South Africa's rating up in the eyes of the international community. In this way they can take some of the additional performance pressures applied by the stakeholders of the locally situated manufacturing sites.

No Assistance form Local Government

To this stage there has been no assistance at all from the local government of any areas to ensure the success of this industry, with them instead relying on the national governments incentive packages.

Even in the hub of the local market, in the Eastern Cape, the local government has been slow to ensure that there will always be a reason for this very badly needed positive influence to remain. The Eastern Cape remains one of the poorest regions in South Africa and a loss of these initiatives would be economically disastrous for the region and politically damaging for the government.

Over emphasis of PGM impact on MIDP

The PGMs that are used in the catalytic converter industry would have been exported even if the industry had not established itself here as they would be needed wherever the converters are made due to South Africa's dominance in its supply.

The large PGM component in the converters have led to special attention being applied to this element of the converter by the MIDP. To add to this is the recent extraordinary rise in price of these metals due to the uncertainty of Russian supply.

The result of the above is that the PGM already receives special attention with a deemed imported content when being used for the MIDP and there are some concerns that even stronger restrictions than presently forecast will be introduced in the short term. This is a serious threat to the local converter industry, due to the fact that if the advantage is reduced then some of the volume may be taken away from South Africa. The same amount of PGM would be sold by South Africa but at present it is at least being used to the advantage of the local economy by ensuring that it is further processed before being exported.

Limited Life of MIDP

It has been clearly stated in the MIDP midterm review released in the middle of 2000 that the MIDP as it is known now will cease to exist at the end of 2007.

Threat of Reductions in MIDP benefits

After many representations from the Catalytic Converter Interest Group here in South Africa the special treatment of the catalytic converter industry was agreed upon with government for the rest of the life of the MIDP despite it being treated as all other components from the beginning of the program.

The maintenance of the special attention paid to the converter industry at an acceptable level was a hard fought battle and the prospect of a change in the Governments view on this issue can never be ruled out. This is especially when there are large fluctuations in the current market due to extremely high PGM prices.

No Local Research and Development

For a country that has around 10% of the world market it is incredible that there is no research and development done in this area. This excludes the possibility of the local market coming up with a major breakthrough that will give it a technology edge over the rest of the world.

Low Productivity of Labour

Although it does appear to be improving the low productivity of local labour remains a threat. The sooner the labour market realises that they are not guaranteed a job and that improvements are needed the better it will be for the local industry. They must also remember that they are not only competing against each other but the rest of the world's labour as well for these jobs.

As the MIDP advantages decrease and finally disappear, then it will be up to the other elements of the cost of manufacture, like labour, to ensure that the local industry remains internationally competitive.

Other participants in the supply chain wanting a share of the MIDP

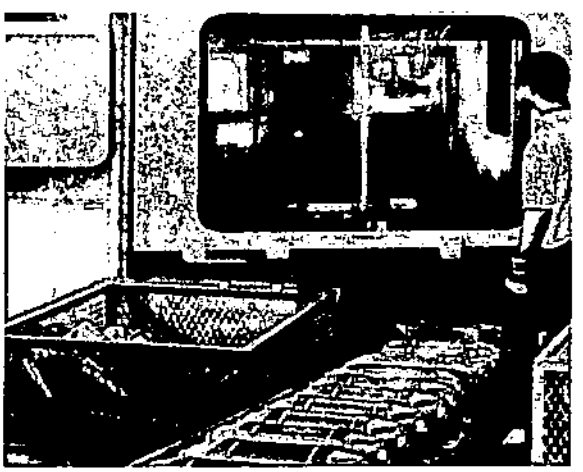
As the local industry has developed over the years and the international OEMs have purposefully placed production volumes in South Africa it has resulted in some other participants in the supply chain realising the value of the MIDP program and consequently looking to share in some of its benefits.

This is mainly when the converter made in South Africa is supplied to another level of supplier, like an exhaust manufacturer, in target area of supply before it is finally delivered to the OEM plant in that area or country. This has resulted in an unnatural downward pressure on the price that would not have occurred without the MIDP and the whole international market is feeling these effects that will slowly disappear as the MIDP advantage reduces and then ceases.

Transferability of equipment

With the international view taken by the OEMs to procurement of converters it is always in the back of role players minds that they may move their focus if the elements that attracted them to a certain area are reduced or improved on elsewhere in the world.

Picture5 : Catalytic converter production facility at Precision Exhaust Systems, Port Elizabeth



This understanding is clearly evident when it is seen how the equipment imported into or constructed in South Africa is of a modular basis that can be quickly taken apart and moved to another location anywhere in the world in a very short space of time.

New Technology

A large amount of time and effort has gone into finding a substitute for PGMs in catalytic converters and although some progress has been made it will still be a while before this become readily available on the international market (CarToday.com., Sept2000).

The main threat is that the South African local content advantage will be reduced due to the absence of PGMs and this in turn will reduce the advantage of the MIDP. It is more than likely however that the MIDP would have disappeared before this new technology comes on stream so the effect will be the same for the South African industry as for the industry in any other area. The main loss will be the reduction in output of PGMs from South Africa and a drop in its prices due to reduced demand

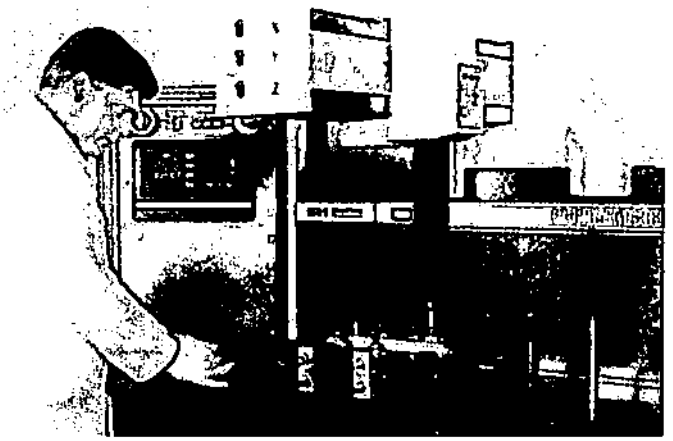
5.05 The international community's contribution

The international players who have established themselves in South Africa to take part in the expansion of the catalytic converter industry and those who have established firm relations with local companies for the same reason have brought a great deal to the South African economy as a whole.

Quality Focus

All the participants in this supply chain are forced to become compliant to one or another quality system like VDA6 or QS9000. This has seen quality become a focus much quicker than would other wise have been the case and this has spread into other areas of the South African economy as well.

Picture 6 : Quality Personel



Know-how transfer

Even if there is no research and development done in South Africa there has still been a large transfer of knowledge to local people in the form of technical quality inspections and construction and maintenance of world class machinery

Foreign Direct Investment

These companies have all brought in foreign currency to help establish themselves in this region. This money would not have been easily raised at a local level without the impetus of the catalytic converter industry.

5.06 Conclusion

The South African catalytic converter industry can be very proud of how it has performed against the large competition for the volume in this product over the last ten years. It must however not become complacent as the very factors that allowed it to grow and become so successful in a relatively short space of time could just a quickly result in its downfall.

There is no doubt that other developing economies in the world have noticed the impact of South Africa on the world market for converters and the impact that this industry has had on the South African economy. Any government would be proud to boast such a success story and as such the attention of the OEMs could easily be sought after by other governments.

Chapter 6

Research Procedure Followed

"Obstacles are those frightful things when you take your eyes off your goal"
Henry Ford

6.01 Introduction

This chapter sets out the procedure followed to assess the long term sustainability of the South African catalytic converter industry in the face of local and international pressures.

An overview of the research procedure will be presented first before discussing the questionnaire and the manner in which the research opinions were gathered. The entities and the relevant representatives selected will then be identified with a explanation of why these people were seen as a good cross section for the industry.

6.02 Research Procedure

In line with the objectives of this research the procedure followed involved discussing the major factors that influence the future sustainability of the South African catalytic converter industry with major role players in the business itself, participating OEMs, the supply side of the supply chain and other controlling bodies.

To facilitate this discussion, two approaches were followed.

- Questionnaire research

  A questionnaire was developed to not only ask very direct questions about the future of this industry, as these role players see it, but also to enable information to be obtained about the origins and growth of the different entities due to a lack of a documented history of this industry.

  The open ended questions used enabled each participant to divulge their own feelings on the subject without being lead in any way.

- Structured Interviews

  To ensure that the correct understanding was obtained from participants a structured interview was held with as many respondents as possible to go through each point highlighted by the questionnaire and the responses offered by them.

  This was extremely valuable especially in obtaining a deeper understanding of the history of the different companies as they made the decision to join the South African Catalytic Converter Industry.

- Research Preparation

  In order to introduce the research proposal to the respondents a letter of introduction and a copy of the questionnaire was sent to each person selected. This was followed up by a telephone conversation to set up a structured interview session during which the questionnaire and the responses could be discussed in detail.

  A copy of this introductory letter is included as Appendix C while a copy of the questionnaire is included as Appendix D.

6.03 The Questionnaire

The questionnaire sent to all respondents and used as a basis on which to hold the structured interviews was divided into five sections.

- Section One – Personal Details

  This section allowed a full understanding of the respondents position not only in his company but the industry as a whole. The questions established the length of time that the respondent has been involved in the industry.

- Section Two – Company Details

  The history of the company was targeted in this section establishing details of investment, size, major focus and growth.

- Section Three – History of the company and industry

  Here the main thinking behind the establishment of the facility in South Africa and the rationale behind the choice of the catalytic converter was investigated. Original equipment involvement and volume growth were other aspects of the company's history that helped to detail the current shape of the industry.

- Section Four – Current Status of the Industry

  A look at the current status of the industry, detailing immediate challenges and world competitiveness, was focused on here. This important information allowed an understanding of the current picture to be obtained at around the halfway mark of the MIDPs life span.

- Section Five – Future Prospects for the industry

  This section being the crux of the whole study looked at the challenges expected to be seen in the near future by this industry. An understanding of what the role players think is needed to ensure the long-term sustainability of this industry was also looked at along with the envisaged prospects if nothing further was done by the authorities.

6.04 Respondents

When looking for respondents it was important that they filled some or all of the following criteria that would allow a well rounded and complete response to the questions asked:

- They had been in the industry for a reasonable period
- They had shown their commitment to this industry by making large investments.

- Their volumes showed them to be important role players.
- They had strong connections with the international industry.
- They had influence over future policy decisions.
- There commitment to the local industry had been shown by their involvement in its future planning through the Catalytic Converter Interest Group for instance.
- They were not all from the same area of the industry.

Taking all of these aspects into account the following respondents were chosen :

Respondent Entity	**Respondent**	**Location**	**Sector**
Delta Motor Corporation Exports Division	Export Director	Port Elizabeth	OEM
Arvin Exhausts	Managing Director	Cape Town	Canner
Precision Exhaust Systems (Pty) Ltd	Managing Director	Port Elizabeth	Canner
Engelhard South Africa (Pty) Ltd	Site Controller	Port Elizabeth	Coater
Tenneco Automotive	Managing Director	Port Elizabeth	Canner
Department of Trade and Industry	Director	Pretoria	Government
Port Elizabeth Regional Camber of Commerce and Industry	Chief Executive Officer	Port Elizabeth	Controlling Body
Autocat Manufacturers	Managing Director	Port Elizabeth	Canner
Daimler Chrysler	Manager	East London	
National Association of Automotive Component and Allied Manufacturers	Chairman	Pretoria	Controlling Body
Faurecia	Managing Director	Port Elizabeth	Canner

In line with most attempts to get feed back, the response was just about fifty percent. The information from those respondents was however excellent. It was also beneficial that

responses from the different areas of the industry were received. This could be seen with OEMs, canners, coaters and governing bodies being represented. The respondents have not been identified in reaction to requests from a few of them.

6.05 Analysis of Research Results

In all areas of the research, the methodology is similar. At stages it is more focused on the individual company and person being interviewed, than on the general industry. In all instances the questionnaire is used as the basis for data collection with additional sources of information only being used when possible and available.

- History of the individual company

  To understand the development of the industry it is important to trace the unique history of the individual companies that are seen as important role players. The use of articles and information brochures ensured a large amount of information on each company was collected before the questionnaire was distributed or interviews done. The research tools then acted as ways to confirm information obtained and fill in any areas that the respondent felt had not been covered sufficiently.

  It is not the aim of this part of the research to do comparative studies into the timing and method of entry into the local industry so no common thread is looked for between the different respondents' comments and information. This information is

purely used to trace the history of the local industry and thereby paint the full picture of the current industry so that an informed look forward is possible.

- History of the industry

To fully understand the history of the industry and the main reason for it being established here in South Africa, the research in this area of the study is aimed at looking for common understanding among the respondents. This is to ensure that a list of prioritised factors be established to give an even handed and complete picture. This information has been used along with that gathered in the previous section to complete chapters four and five of this report.

- Current status and future prospects of the industry

As with the above section, the information gathered from the individual respondents in this part of the research is put into tables to be analysed to look for common understanding. This is then used to generate a prioritised list of the major factors to be looked at when assessing the current status and long-term prospects of this industry.

The list is established through the questionnaire analysis and from other notes taken during the structured interviews. The prioritisation of this list is purely based on the number of times a factor is mentioned by the different respondents while at the same

time taking into account the emphasis placed on each issue during the interviews by the particular respondent.

Some of this information is used in chapter 5 to get an idea of where the industry is now both as a part of the South African economy and as a player in the international catalytic converter industry. The rest of the information is used in the concluding chapters where the future of this young but important industry is investigated.

6.06 Expected Results

In many studies it is of great use to have expected results against which to compare actual results as they are compiled to ensure that they are:

- relevant
- feasible
- reliable.

This however is not possible in this study. There is no historic body of knowledge to compare results to and it would be counter productive for any preconceived ideas to get in the way of collecting the thoughts of the role players in the industry when that is the main focus of the study.

6.07 Conclusion

This chapter has set out the scope of the research procedure followed, the research tools used and the manner in which the research findings were analysed. The restrictions compared to traditional research have also been highlighted along with the measures taken to ensure the research remains focused to achieve the initially set out objectives.

The analysis of research results is done in the most appropriate and simplistic manner possible to ensure the results are both understandable and a true reflection of the respondents comments.

In the next chapter the actual results of the study will be revealed and the major factors facing this unique industry will be discussed in more detail.

Chapter 7

Discussion on Research Finding

"You cannot escape the responsibility of tomorrow by evading it today"
Abraham Lincoln

7.01 Introduction

The research conducted among the many different role players from all sectors related to the South African Catalytic Converter industry brought out a number of varied and interesting ideas. The reasons for the development of the local industry and its history to date, which also formed part of the input from respondents, has been recorded in previous chapters. This chapter presents the empirical findings that support these views. It is then the main focus of this chapter to present and after that to discuss the major factors influencing the long-term sustainability of the catalytic converter industry in South Africa in the face of local and international pressures. The results of the research are first presented in a table form and then displayed in a graph. A short analysis of all these

presentations then follows before the elements of the major focus areas for this report are discussed individually and in detail.

At this point it is important to highlight the focused intention of this study as stated in the beginning of this research report. The clear intention is to look specifically at this industry and its prospects without getting involved in speculation about whether this sort of success can be replicated in other industries as well.

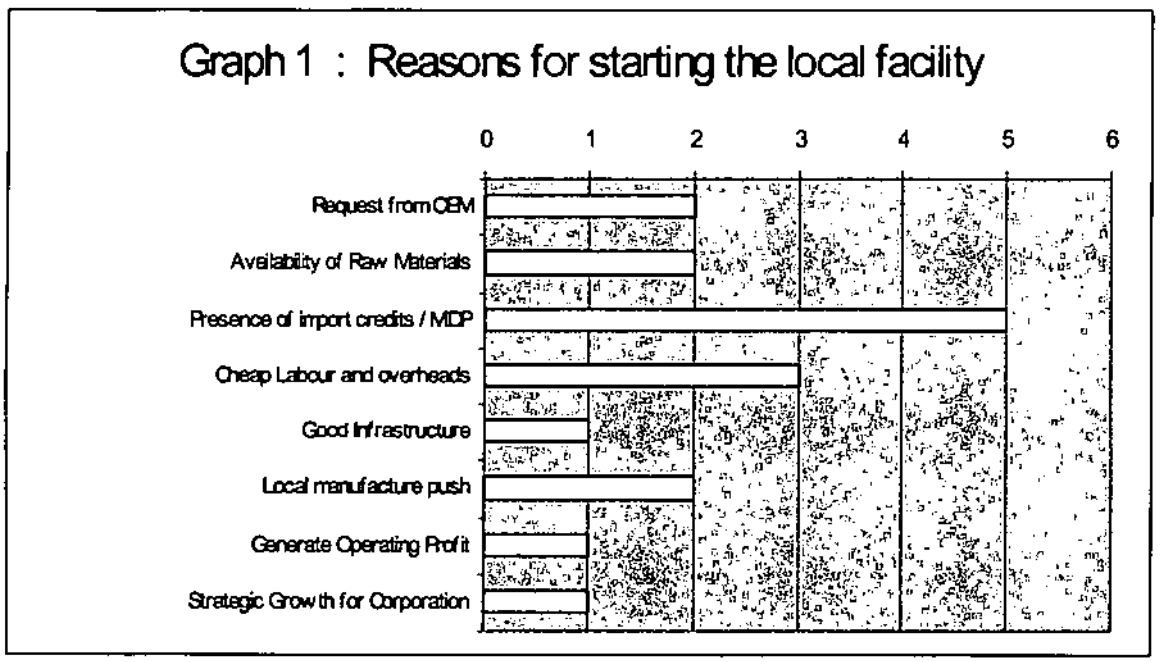
It is also important to remember that when gaining the ideas of the people involved in a certain situation or segment there are no right or wrong answers. There are only the ideas and feelings of the people chosen to participate in the study and the careful selection of these people is the most important way in which credibility and reliability can be given to the results.

While an attempt to put the different ideas into some sort of priority has been made it is not always that easy to separate them. Those ideas that fall together into the broader categories of essential, important and of interest or less important, by virtue of the number of times they were mentioned by the different respondents, are easy to categorise. The final ranking of those ideas that fell into the broader categories however came down to the way in which those who were interviewed talked about the individual ideas.

7.02 Reasons for starting the Local Facility

Table 1

Reasons for starting the local facility	Total	Rank
Request from OEM	2	4
Availability of Raw Materials	2	3
Presence of import credits / MIDP	5	1
Cheap Labour and overheads	3	2
Good Infrastructure	1	6
Local manufacture push by Columbus Stainless Steel	2	5
Generate Operating Profit	1	7
Strategic Growth for Corporation	1	8

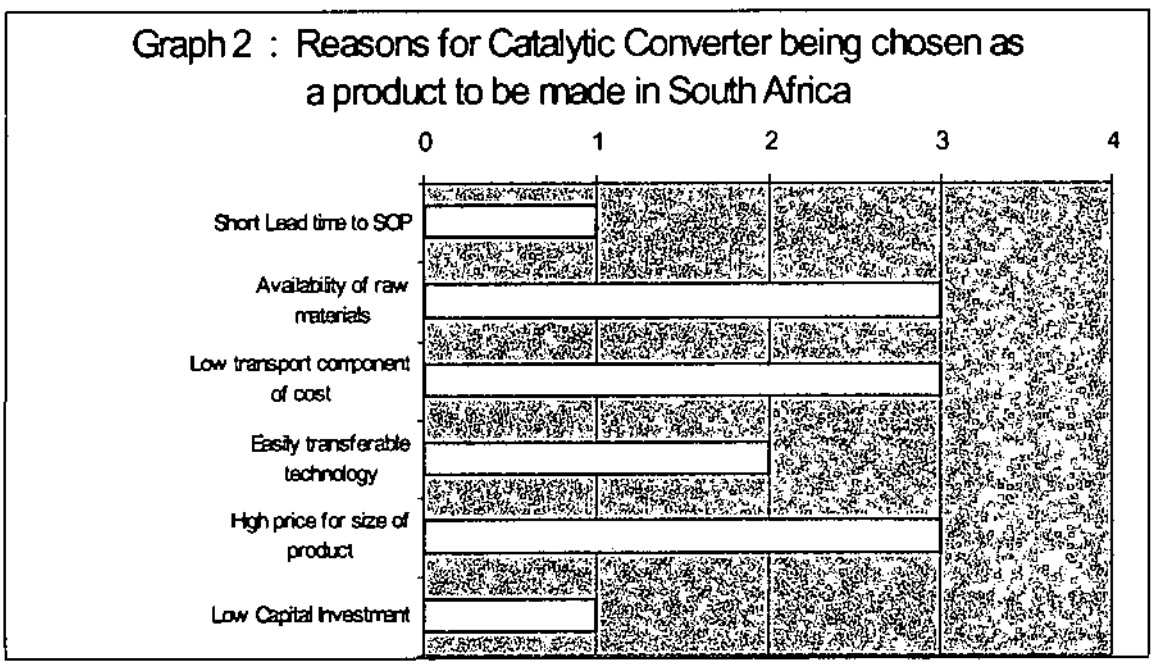


The presence of the MIDP is clearly the main reason for these facilities existing in the first place. Cheap labour and overheads were the next most important with the influence of the raw materials, OEMs and local manufacture following close behind.

7.03 Reason for the catalytic converter coming to South Africa

Table 2

Reasons for Catalytic Converter being chosen as a product to be made in South Africa	Total	Rank
Short Lead time to SOP	1	6
Availability of raw materials	3	3
Low transport component of cost	3	1
Easily transferable technology	2	4
High price for size of product	3	2
Low Capital Investment	1	5



The low transportation costs were seen as most important factor that brought the catalytic converter to South Africa. The small size of the item is closely related to this as it has a strong influence on logistics costs.

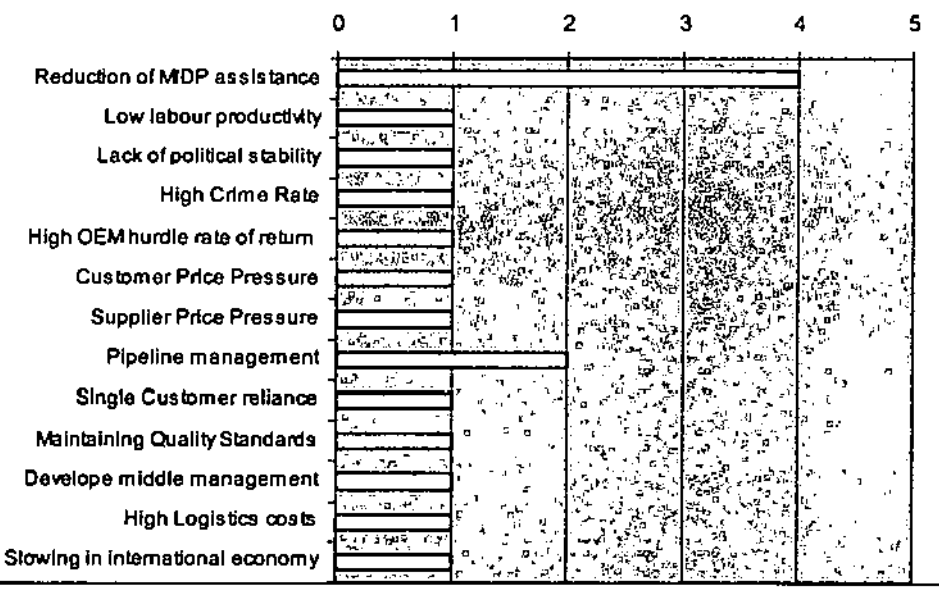
The high price and local raw materials saw the influence of the MIDP showing through as these aspects meant that the maximum benefit could be obtained from the rules of this program. The ease of transferring the technology and setting up and operation then came in as of lesser importance.

7.04 Current Challenges facing the industry

Table 3

Challenges facing the catalytic converter industry at this stage	Total	Rank
Reduction of MIDP assistance	4	1
Low labour productivity	1	7
Lack of political stability	1	8
High Crime Rate	1	3
High OEM hurdle rate of return	1	6
Customer Price Pressure	1	4
Supplier Price Pressure	1	5
Pipeline management	2	2
Single Customer reliance	1	13
Maintaining Quality Standards	1	9
Develope middle management	1	12
High Logistics costs	1	10
Slowing in international economy	1	11

Graph 3 : Challenges facing the catalytic converter industry

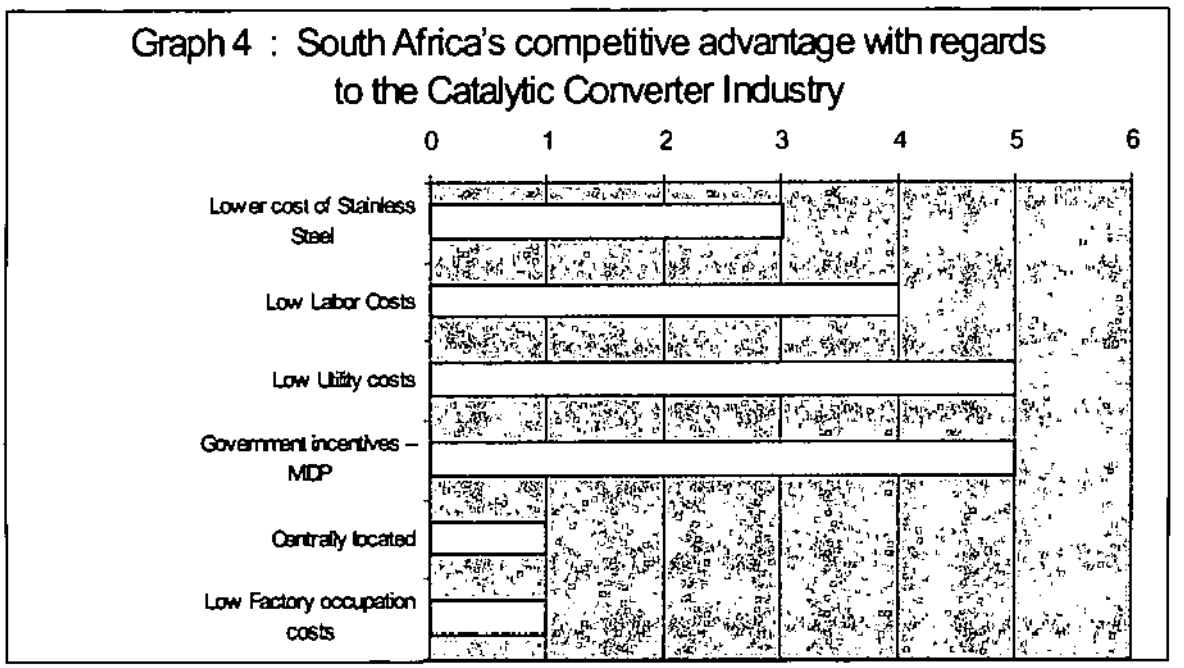


These results showed the vast array of challenges facing this industry but more importantly highlighted the importance of the MIDP to this industry and it prospects of future survival.

7.05 South Africa's competitive advantage

Table 4

South Africa's competitive advantage with regards to the Catalytic Converter Industry	Total	Rank
Lower cost of Stainless Steel	3	4
Low Labor Costs	4	3
Low Utility costs	5	2
Government incentives – MIDP	5	1
Centrally located	1	5
Low Factory occupation costs	1	6

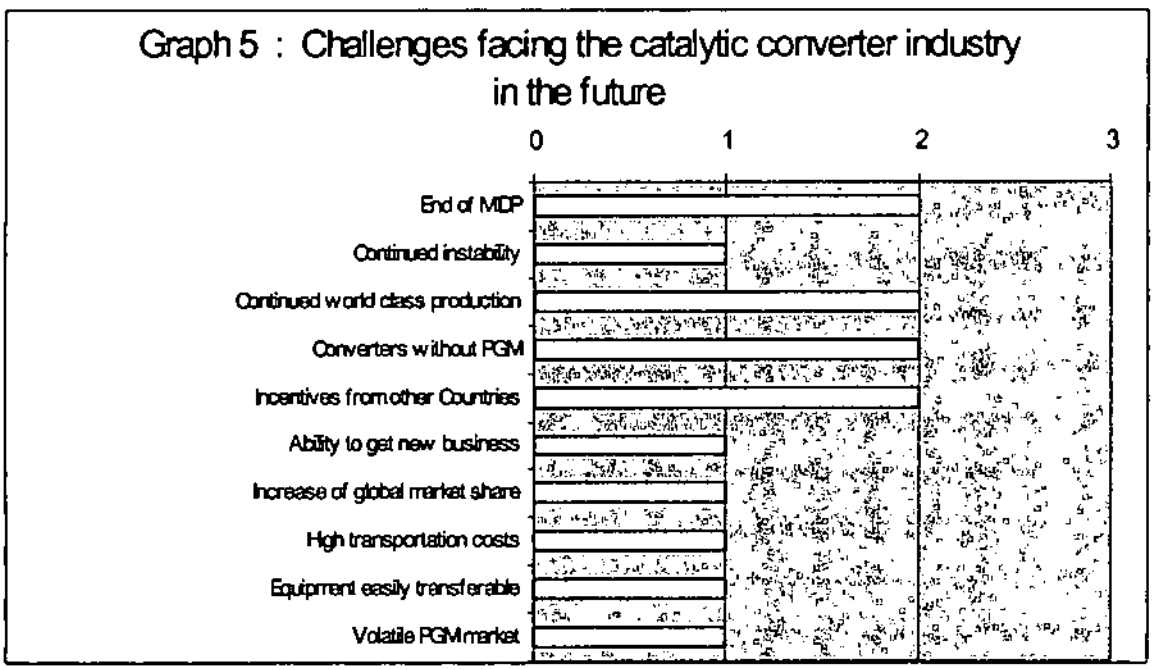


Once again the MIDP shows up as one of the major contributing factors to the success of this industry. Low utility and input costs were also seen as important.

7.06 Challenges in the future

Table 5

Challenges facing the catalytic converter industry in the future	Total	Rank
End of MIDP	2	1
Continued instability	1	5
Continued world class production	2	4
Converters without PGM	2	3
Incentives from other Countries	2	2
Ability to get new business	1	7
Increase of global market share	1	6
High transportation costs	1	8
Equipment easily transferable	1	9
Volatile PGM market	1	10

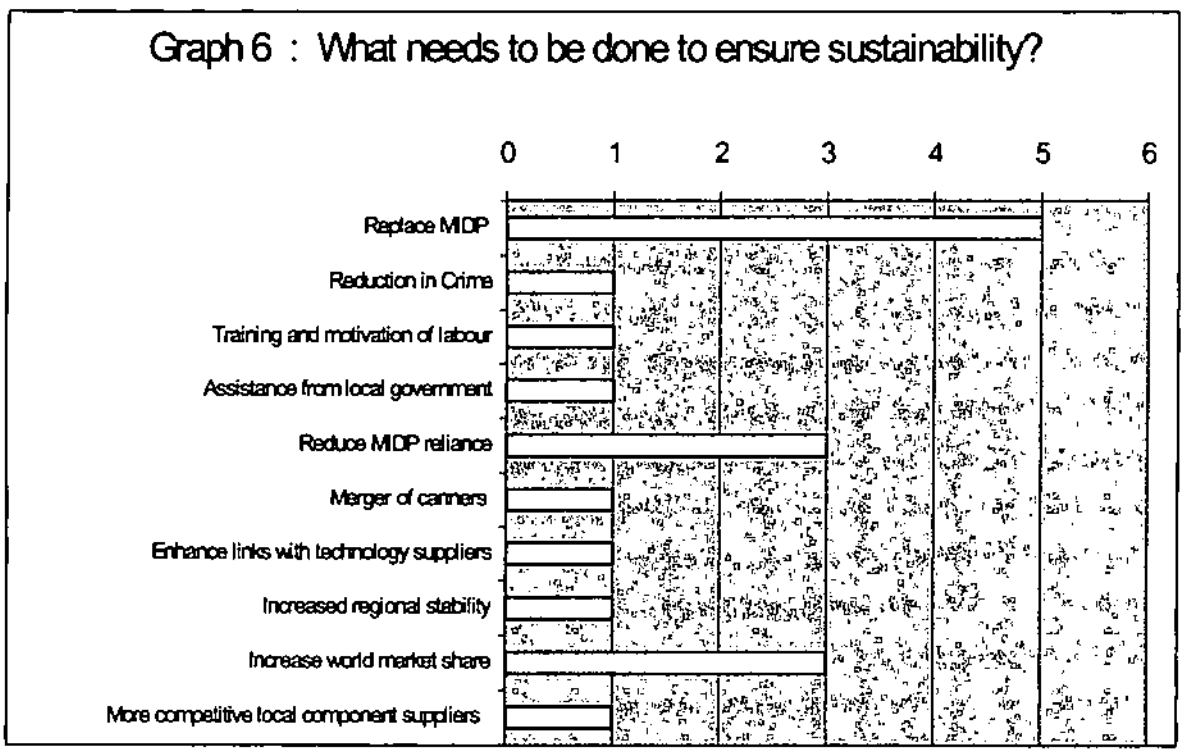


The end of the MIDP remains the focus point for the respondents in this regard and it can be associated with the second most important factor in that other countries may bring in something like the MIDP on the strength of the observed success here in South Africa. The removal of PGMs from converters and a lack of quality focus followed this with some other ideas ranking as less important.

7.07 What will ensue the sustainability of the converter industry

Table 6

What needs to be done to ensure the sustainability of this industry into the future?	Total	Rank
Replace MIDP	5	1
Reduction in Crime	1	8
Training and motivation of labour	1	5
Assistance from local government	1	4
Reduce MIDP reliance	3	2
Merger of canners	1	10
Enhance links with technology suppliers	1	6
Increased regional stability	1	7
Increase world market share	3	3
More competitive local component suppliers	1	9



The first signs of the split between government and corporate responsibility become evident in this section. The most important factor by far is with the government and the need to replace or extend the MIDP. The respondents did not however leave all the

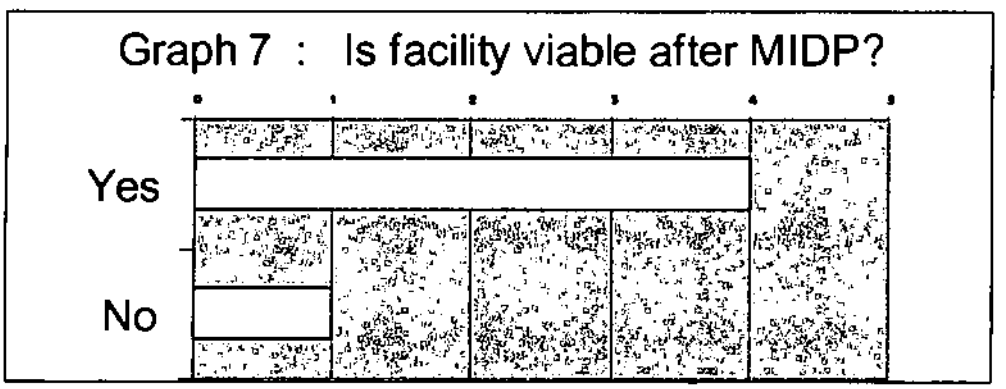
responsibility there by their encouragement of companies to reduce reliance on the MIDP and further increase South Africa's international market share. The other lesser suggestions could also be divided into these two groups for discussion.

These options are discussed in detail later in this chapter.

7.08 Viability of entities

Table 7

Viability of the facilities	Yes	No
Is facility viable after MIDP	4	1



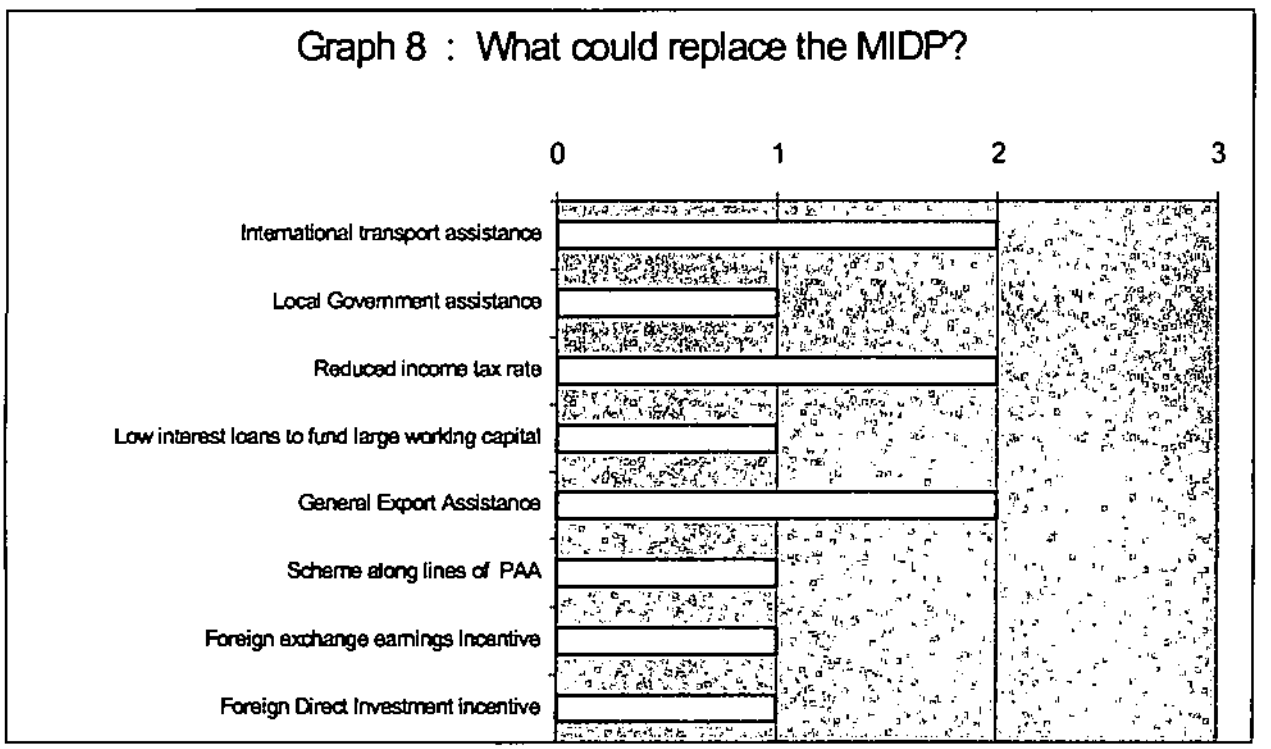
Although only one of the respondents felt that their company would cease to exist if the MIDP fell away it must be remembered that some of the respondents were from companies like OEMs that are not solely reliant on the catalytic converter for their existence.

Those catalytic converter companies that said they would be viable however did say that this would be with much lower returns and only after substantial work and focus between now and the end of the MIDP in 2007

7.09 Future Options for Replacement of MIDP

Table 8

What could replace the MIDP?	Total	Rank
International transport assistance	2	2
Local Government assistance	1	5
Reduced income tax rate	2	1
Low interest loans to fund large working capital	1	4
General Export Assistance	2	3
Scheme along lines of PAA	1	6
Foreign exchange earnings incentive	1	7
Foreign Direct Investment incentive	1	8



The different ways in which the role players in the industry feel that the government should assist were varied. Reduced taxation rates and assistance with transport costs were some of the main ideas while the continuation of the MIDP or the starting of something similar was also seen as a good option. These ideas are discussed in more detail below under the section dealing with the replacement of the MIDP.

7.10 Replacement of the MIDP

All respondents saw the replacement of the MIDP or its continuation in some or other form after 2007 as essential for the sustainability of this industry in South Africa. This is a rather obvious statement if one looks at the reasons for the industry starting here in the first place. It is stated quiet clearly in the early chapters of this report that the major reasons for the catalytic converter industry coming to South Africa was the introduction of export rebates into the incentive programs like the Phase VI and MIDP.

This idea carries a great deal of merit but also raises two important issues. Firstly it has to be remembered that South Africa's involvement with the World Trade Organisation means that there is a great deal of pressure to reduce all forms of protection so that the local economy can trade as an open market. It is therefore clear that any scheme put into place or any enhancement of the current scheme set up to continue after 2007 will have to be approved by the WTO and therefore adhere to its guidelines in all respects.

The second issue is what would replace the MIDP after its currently scheduled conclusion at the end of December 2007. The role players who participated in the research for this report had the following ideas that could see the industry remain on its current path of growth and prosperity or at least remain viable at its current level.

Reduced Company Taxation Rates

This would once again be direct National Government involvement with the granting of company direct taxation relief to the local production facilities. This would have two advantages.

- Firstly the companies would be able to be more competitive on the international market with lower statutory taxes to pay. The local companies would therefore make a higher return for their stakeholders without increasing there turnover or decreasing their cost structure.

- Added to this is, for the company to take advantage of this they would have to make and declare a profit in the locally established entity. This is especially beneficial when the company is a part of a large multi-national group that may be tempted to transfer and declare profits in other areas of the world.

International Transportation Cost Assistance

As mentioned in earlier chapters, one of the big challenges facing the catalytic converter industry is that it is a long way from its end customer who is more often than not situated in Europe. At the moment, one of the only reasons this distance does not cause a huge problem, is that the MIDP advantage more than makes up for the larger transport costs incurred by local manufacturers when compared with manufacturers situated much closer to the end customer. This is especially apparent when one realises that the major raw

materials, including precious metals are available in those areas at very similar if not the same prices as they are available in South Africa.

One of the ways of doing this is for the government to have a look at some sort of subsidy to assist the local companies to meet these high transport costs and still remain competitive. Depending on how this is structured it could still be seen as a form of protection by the WTO.

A better way of trying to do this would be to organise a cluster of mutual agreement in which all parties work together for the better of all concerned. Here the government could use the awarding of other contracts as a bargaining chip to get the large multi national forwarding companies to assist with keeping the large transportation costs under control.

General Export Assistance

This would entail the continuation of the current scheme in a revised form or the introduction of a brand new scheme that also uses export rebates as an incentive to develop the export part of the local industry. As has already been mentioned this would not be seen to favourably by the World Trade Organisation and therefore this would be very difficult to introduce without the involvement and agreement of this organisation.

Low interest loans to fund large working capital commitments

For the same reasons that high transport costs are incurred, a large amount of working capital is tied up in supplying catalytic converters to foreign customers. The raw

materials are needed for up to a month and a half in South Africa before the final product spends three weeks on the water on its way overseas. There is then still a small delay before delivery takes place and after that standard payment terms for the customers apply. This can result in the major portion of the raw materials being financed for up to four months.

Add to this long time the fact that South African interest rates have a history of being higher than other parts of the world competing for this business and it is easy to see how the government could get involved. The South African development bank could be used as a vehicle to finance some or all of the working capital requirements for these companies at a reasonable or at least internationally competitive interest rate.

Local Government Assistance

The MIDP and other schemes have always been controlled by the national government. It is seen by some as an option for the regional or local government to get involved in assistance to the entities in their area. This idea would be easy to implement in the Eastern Cape where there is a large concentration of entities involved in the catalytic converter industry. Things that could be considered by these local authorities would be along the lines of subsidisation of utility costs or financial assistance based on the number of employment opportunities generated.

The problem with this idea is that there are some regions where there is not a large number of entities in the same regional area and it would be difficult for those local governments to make and administer special consideration for one or two companies.

Another problem associated with this idea is that, as mentioned above, a large percentage of the South African catalytic converter entities are situated in the Eastern Cape which has always been and still is one of the poorest regions in the county. This would make it very difficult for this region to finance this sort of assistance without the direct involvement of the national government.

Regional government departments have also found many problems with administration of their regions over the years and to add this sort of administration burden onto these departments is also not seen as a feasible solution.

Productive Asset Allowance Scheme (PAA)

One of the prospects for the future is the introduction of a productive asset allowance. In this type of scheme, a company will be entitled to deduct a certain percentage of the capital investment specifically introduced to produce goods for export from their taxable income. This would be in excess of the depreciation or wear and tear that is allowed as a deduction in the normal course of business.

There are some small schemes like this in operation at present but they have not been too successful to date due to the strict rules surrounding the use of the assets. This problem

mainly centres around the fact that if the asset is used for any other purpose what so ever, no matter how small, then the whole allowance is disallowed.

These types of schemes also don't hold to much promise for the catalytic converter industry. This industry does not use very expensive machinery to manufacture the converters. The major investment is in research and development and in the cost of the local raw materials which under a PAA scheme would not have any effect on the amount of advantage gained from the scheme.

Foreign Exchange Earnings Incentives

Any country that wants to be in a healthy financial position and give its people a good quality of life and standard of living will need to attract foreign currency into that country to help balance the books when it comes to paying for the import of goods from other countries that cannot or are not made in that particular country. With the export nature of the catalytic converter industry it is clear that this a major source of foreign exchange and an incentive based on the amount of foreign exchange attracted to the country could well be a solution to the question of what will follow the MIDP.

It is however important to keep in mind that the major part of the cost of the converter is the precious metals that it is coated with. When you keep this in mind and remember that South Africa is now one of the few and the largest producer of platinum group metals then it is plain to see that no matter where the converter industry is based the foreign

exchange will come to South Africa as it will still export the PGM to wherever the converters are being made.

Foreign Direct Investment incentives

Getting other countries to invest in your local economy is a very good way of strengthening that local economy and at the same time attracting foreign exchange to the target country. This could also be considered as a way in which the government could assist the converter industry after the end of 2007.

One of the main concerns with this scheme is that one of the reasons that the catalytic converter industry came to South Africa so quickly was because it is not very expensive to set-up a catalytic converter plant. The result is that very little investment actually flows to South Africa for a company to set-up a production facility and the result is that comparatively little advantage would flow to the companies from this sort of scheme.

Added to these concerns is the fact that most of the international role players have already established themselves in South Africa so if this scheme was decided on then it would have to be retrospective to be of any effect at all and this would be very difficult to control.

7.11 Reduction of reliance on the MIDP

The MIDP has become so much a part of the catalytic converter industry that it is often felt that there cannot be one without the other. This way of thinking will need to change if

people accept what is in the MIDP mid term review and realise that at the end of 2007 the MIDP will cease to exist, at least in its present form.

This means that this industry has seven years to get itself globally competitive so that it can compete against the potential suppliers from other areas of the world. The use of MIDP rebates to subsidise reduced prices to customers overseas will have to stop. This is especially important when one is negotiating a new long-term contract that could stretch close to 2007 or even beyond.

This reduction of cross subsidisation will not be an easy task by any measure. The pressures that are being put on all tiers of suppliers into the OEMs to maintain if not reduce costs will remain immense. It is therefore short sighted to think that they will simply allow an upward movement in the price. A clear strategy to deal with this is needed and the involvement of all suppliers, including the labour force will be needed to achieve this.

7.12 Increase world market share

Even though there is already an imbalance, with South Africa producing less than one percent of the worlds cars while at the same time producing eight to ten percent of the worlds catalytic converters, one of the ways of ensuring the sustainability of this industry would be to increase this percentage of world production of converters to between 20 and

25 percent. This is however a very large increase which is not made any easier by the continued instability in the Southern African region.

For the OEMs to commit more resources and volume to this region it would be imperative that the industry proves itself to be more than a temporary cost saving initiative, of the international OEMs, based on an incentive scheme that has a terminal life span, in a very risky business environment. For this to happen it would take the sustained efforts of South Africa's neighbouring countries, the South African Government and all the people of South Africa to raise the level of confidence and business ethic of the whole region.

7.13 Local Government Assistance

This has already been discussed, with all its positives and negatives, in section 7.10 of this report where local government assistance is seen as a way of replacing the MIDP. In the same way this sort of assistance could also work in conjunction with a revised MIDP or other incentives to make up a package that would keep the South African industry in its present state of competitiveness.

7.14 Training and Motivation of Labour

One of the factors that attracted the converter industry to South Africa was the low cost of labour that is available in this economy. This, as always, does come at some price and the price that is paid in this instance is in error generated scrap and low productivity levels.

With the reduction and possible disappearance of the MIDP on the horizon, this is an area of opportunity for the local industry to reduce cost or at least increase output without a corresponding increase in costs. The skills development act that has come into effect during 2000 should go a long way to ensure that focused and structured training is done to enable the skill level of the labour force to be lifted.

The motivation of the labour force and lifting of productivity levels is a much more complex and long-term issue than the training aspect. The majority of the labour force has always had a culture of getting things done in their own time and it could take generations to change this mind set, but a start needs to be made.

7.15 Enhanced links with technology suppliers

The lack of research and development in South Africa is a problem for a country that does nearly 10 percent of the world's production and at the same time is looking to possibly double this percentage. One of the ways of keeping or making this sort of market

share would be to ensure that at least some of the new technologies are being developed and patented here in South Africa. The only way to do this would be to get the local canners to have a much closer tie with the overseas first tier suppliers, and in reality, actually become part of their business.

This is not easy with the large amount of business risk in the area and a lack of the technological skill and experience to do this sort of research and development. It would be a large step for any company to base these sort of resources here and an enormous amount of ground work and stability would need to be put in place before this became possible.

7.16 Reduction of crime and increased stability

For any venture to be successful on a long-term basis it is of great importance that there is confidence in the support structure that surrounds it. This is not one of South Africa's strong points with high labour unrest and crime that appears to be rampant. When this is coupled with the instability of the country's geographical neighbours, like Zimbabwe, then it is not difficult to see why large multi national organisations are hesitant to commit increased amounts of capital investment or volumes of supply into the area.

It is the Governments responsibility to ensure that this is done and they need to use all the tools at their disposal to achieve it. It is time for high level pressure to be put on those individuals and countries that are causing instability in the region, to change their ways for the good of all the people in the region.

7.17 Merger of canners

The reliance of some of the canners on one particular OEM or first tier supplier makes for very risky business. A change in the thoughts of one of the buyers in this associated company could lead to the closure of a plant in South Africa and severely dent the confidence in the long-term sustainability of the South African industry. It could cause others to reassess their commitment to the South African industry and a large scale withdrawal of support could result.

A means of negating this exposure would be for those canners who are not directly linked to a particular OEM or first tier supplier to merge and thereby diversify their customer base so as to reduce the risk of such a plant closure.

7.18 Conclusion

It is clear from the above that there are a number of stumbling blocks in the way of a sustained catalytic converter industry in South Africa. There are, though, also a number of potential solutions that could be put in place to see this industry not only survive but even grow.

The ideas of the role players, as identified and discussed above, are critical to the long-term sustainability of this industry. The only thing that everyone, however, that responded agreed on is that there is going to have to be some action in some form or other for this industry to survive in South Africa.

A wait and see approach was not even mentioned by a single respondent so a large amount of effort is going to be needed by all those involved in the South African catalytic converter industry as a whole or its support structures in a broader view.

Chapter 8

Conclusion

"There is no easy walk to freedom, we must go through extreme difficulties before we reach the mountaintop of our desire."
Nelson Mandela

8.01 Research summary

The objective of this research was stated at the start of this report as being aimed at finding out if the South African Catalytic Converter Industry is sustainable in the face of local and international pressures.

In summary, the process followed was to gleam as much information as possible from articles and reports on the catalytic converter industry to enable its origins and history to date in South Africa to be traced. Important constituent factors of the industry, like the MIDP and the product itself were also documented at an early stage. The more formal sources of information were limited due to the short period of time that this industry has existed .

Questionnaires were then distributed to selected role players in the industry to obtain their assistance in not only filling in the information gaps around the history of the industry but also to obtain their views on the current and future challenges that threaten the very future of this industry. These questionnaires were then followed up with structured interviews that allowed for a free flow of information to ensure that the questions asked and the answers given were fully understood by all involved.

The answers to the different categories of questions were then analysed in their respective groups. This was done to ascertain those ideas that are seen as the most important by the number of times they are mentioned by the different respondents. Although all the ideas forwarded were used the counting of responses was done to enable the ideas to be ranked by importance.

Once the responses had been analysed, the information was used to:

- fill in the gaps concerning the history of the industry
- document the industry's current structure and its relationship to the international industry.
- Detail the challenges facing the industry
- Look at what needs to be done to make the industry sustainable.

The ideas about what needs to be done to make the industry sustainable were then discussed in detail to provide a full understanding of the respondent's feelings and ideas.

8.02 Conclusion from the research

Although the research was done with very different people and at different times it was quiet clear that there is a broad consensus of opinion on what has to be done to ensure the South African catalytic converter industry remains a permanent fixture in the South African economy. The more detailed ideas of exactly how to implement this broad strategy on the ground did however vary considerably but they were all based on sound business principles and led to a number of feasible ideas being brought together.

The ideas that came forward can be divided into two broad categories. Firstly there is the government's involvement and then there are the corporate strategies that have to be reassessed if this industry is going to remain viable.

Government Involvement

In just about all instances the respondents felt that the involvement of the government was of paramount importance. They stated quiet openly that they did not feel that this industry could overcome the obstacles facing it with out the involvement of government either at a national or perhaps on a regional / local level. This feeling was evidenced by one respondent who definitely felt that their facility would not be feasible without the MIDP or something of a similar nature.

The ways in which it was felt that the government could get involved varied and included:

- Replacing the MIDP with another scheme, fore example:
    - Reduced income taxation rates
    - International transport assistance
    - General Export incentives
    - Low interest working capital loans
    - Local government assistance
    - Productive Asset Allowances
    - Foreign Exchange Earnings incentives
    - Foreign Direct Investment Scheme
- Reduction of crime in the country
- Increasing stability in the country and its neighbours
- Negotiating with large corporates to increase their involvement in the local economy

All of these above ideas are discussed in detail in the previous chapter of this report where their associated advantages and disadvantages are looked at. When looking at all these ideas however it becomes blatantly clear what the people in this industry expect from the government.

Firstly there is no doubt that some sort of direct assistance is needed from the government to enable the local industry to survive. Taking all the relevant information into account it

appeared that the consensus is that the use of reduced income taxation rates is the best way of lending assistance. The next best way seemed to be a transport subsidy or a low interest loan to cover the working capital needs of the entities due to the distance from their customers. The high cost of the raw materials and the fact that these suppliers are so much further from the customer than other potential suppliers make these incentives among the preferred vehicles for support. It was also always said that it does not have to be one or the other incentive but two or more incentives could work together to achieve the level of support that is deemed necessary.

The second area that was highlighted for the government to concentrate on was the instability of the Southern African region and the high crime rate in South Africa. This is seriously hurting investor confidence. The respondents were very strong in their beliefs that this has to receive urgent attention from all levels of the government as it is something that is threatening the whole economy and not just the catalytic converter industry.

It was also stressed that these two areas of focus could not be seen in isolation as it would be useless to have a wonderful array of incentive programmes in a country that no one wants to work in due to the uncertain and unsafe conditions that prevail. The government therefore needs to work on both of these aspect at the same time.

Corporate Strategies

Most of the respondents felt that there was a mixture of responsibility for the continued success of this industry and therefore declined to lay the whole problem at the governments door.

They felt that the corporations that are involved in the local catalytic converter industry could assist in the following ways to ensure that their livelihood is assured:

- Reducing their reliance on the MIDP rebates
- Increasing the world market share of this industry
- Local government assistance
- Training and motivating labour
- Enhancing the links with the international technology suppliers
- Merging canners to get a sound customer base.

It was encouraging to see from the above that the local role players were not expecting everything to be done for them by the government. It is clear that the local role players accept their part of the responsibility in ensuring that they have a future here in South Africa.

The major thrust of this responsibility lies in the relationship with the customers overseas whether it be the OEM itself or another first tier supplier. It is understood that it is the company's responsibility to prepare those overseas for the demise of the MIDP and gain

their cooperation in ensuring that all future contracts are made on a basis that is viable for all. The financial advantages are going to reduce over the next few years and it is up to the local companies to prove to the overseas partners that it is still to their benefit to do business with the South African industry.

The local cost savings and identification of artificial incentive scheme advantages to the supply chain needs to become part of the every day life of the local industry entities. This needs to be done so that the reduction of the MIDP and transition into the next phase of the South African catalytic converter industry's life can be done as smoothly as possible.

8.03 Final Conclusion

The one thing that is without question is that this young industry in South Africa is under threat. Every person spoken to during this research emphasised the need for action and the need to act soon. 2007 will be here before we know it and this industry that is one of the shining lights in South Africa and about the only good news to come out of the Eastern Cape region in a long time, could very well cease to exist if no effective action is taken.

If this industry is to survive into the future then it is going to take an immense effort from the government and the industry role players to ensure that all the good work done is not destroyed in as short a time a time as it was set-up. Bodies like the catalytic converter interest group and the Department of Trade and Industry have large roles to play as it is

these bodies that will be looked at to formulate ideas and action plans and ensure that these plans are feasible.

The respondents agree that it is only going to be through a combination of efforts from the government and local stake holders that will see the South African catalytic converter industry being sustainable into the future.

Appendix A

Comparative analysis of historical data gathered

Table 1
Reasons for starting the local facility

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
Request from OEM	1			1		2	4
Availability of Raw Materials	1		1			2	3
Presence of import credits / MIDP	1	1	1	1	1	5	1
Cheap Labour and overheads	1		1		1	3	2
Good Infrastructure	1					1	6
Local manufacture push by Columbus Stainless Steel	1		1			2	5
Generate Operating Profit		1				1	7
Strategic Growth for Corporation					1	1	8

Table 2
Reasons for Catalytic Converter being chosen as a product to be made in South Africa

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
Short Lead time to SOP	1					1	6
Availability of raw materials	1	1	1			3	3
Low transport component of cost	1	1		1		3	1
Easily transferable technology	1	1				2	4
High price for size of product	1	1		1		3	2
Low Capital Investment		1				1	5

Table 3
Challenges facing the catalytic converter industry at this stage

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
Reduction of MIDP assistance	1		1	1	1	4	1
Low labour productivity	1					1	7
Lack of political stability	1					1	8
High Crime Rate	1					1	3
High OEM hurdle rate of return	1					1	6
Customer Price Pressure		1				1	4
Supplier Price Pressure		1				1	5
Pipeline management		1	1			2	2
Single Customer reliance		1				1	13
Maintaining Quality Standards				1		1	9
Development of middle management skills				1		1	12
High Logistics costs					1	1	10
Slowing in international economy					1	1	11

Table 4
South Africa's competitive advantage with regards to the Catalytic Converter Industry

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
Lower cost of Stainless Steel	1	1	1			3	4
Low Labor Costs	1	1	1		1	4	3
Low Utility costs	1	1	1	1	1	5	2
Government incentives – MIDP	1	1	1	1	1	5	1
Centrally located – Europe. Asia, America, Australia			1			1	5
Low Factory occupation costs				1		1	6

Appendix B

Comparative analysis of future data gathered

Table 5
Challenges facing the catalytic converter industry in the future

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
End of MIDP	1			1		2	1
Continued instability	1					1	5
Continued world class production	1			1		2	4
Converters without PGM		1	1			2	3
Incentives from other Countries		1	1			2	2
Ability to get new business			1			1	7
Increase of global market share				1		1	6
High transportation costs				1		1	8
Equipment easily transferable				1		1	9
Volatile PGM market					1	1	10

Table 6
What needs to be done to ensure the sustainability of this industry into the future?

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
Replace MIDP	1	1	1	1	1	5	1
Reduction in Crime	1					1	8
Training and motivation of labour	1					1	5
Assistance from local government	1					1	4
Reduce MIDP reliance	1	1			1	3	2
Merger of canners for a diversified customer base		1				1	10
Enhance links with technology suppliers			1			1	6
Increased regional stability			1			1	7
Increase world market share	1		1	1		3	3
Local component suppliers need to be more competitive in the global market					1	1	9

Table 7
Viability of the facilities.

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Yes	No
Is facility viable after MIDP	1	1	1	0	1	4	1

Table 8
What could replace the MIDP?

Response	Reply 1	Reply 2	Reply 3	Reply 4	Reply 5	Total	Rank
International transport assistance	1				1	2	2
Local Government assistance	1					1	5
Reduced income tax rate	1				1	2	1
Low interest loans to fund large working capital	1					1	4
General Export Assistance		1		1		2	3
Scheme along lines of PAA			1			1	6
Foreign exchange earnings incentive					1	1	7
Foreign Direct Investment incentive					1	1	8

Appendix C

Introductory letter to respondents

27 Dyason Street
Mount Croix
Port Elizabeth, 6001

E-Mail : robe@pes.co.za
17 May 2000

Mr Robin Holmes
Precision Exhaust Systems (Pty) Ltd
Aloes Industrial Park
Markman Township
Port Elizabeth

Dear Robin

Masters in Business Leadership (MBL) Thesis

I am at present in the final year of my MBL through UNISA. In part fulfillment of this degree it is required that we choose a topic on which to do research and complete a thesis.

I have for the last two and a half years been involved in the Catalytic Converter industry in my capacity as firstly accountant of Engelhardt South Africa (Pty) Ltd and now as Financial Manager of Precision Exhaust Systems (Pty) Ltd. It is due to this involvement and a desire to learn a little more about the history, current status and future prospect of this industry that I have decided to do my thesis on these aspects of the Catalytic Converter Industry in South Africa.

As the South African Catalytic Converter industry is still relatively young it is not possible to do very much research out of books. I therefor request a little of your valuable time, as a role player in this industry, to enable me to gain your impressions of the above aspects of this industry.

I attach a questionnaire and would appreciate the opportunity to discuss this with you in person once you have had a chance to read through it.

I would like to thank you for your assistance in this regard.
Yours Sincerely

Robert John Elfick CA(SA)

Appendix D

Questionnaire

Questionnaire for MBL thesis on the South African Catalytic Converter Industry.

1. Personal Details

   Full Names :_____

   Capacity :_____ Number of years in Industry :_____

2. Company Details

   Full Name of Company :_____

   When established :_____

   Capital Invested to date :_____

   Associated OEM(s) :_____

   Coater(s) used :_____

   Top Five Suppliers :_____

   Number of Employees Production :_____

   Support :_____

   Number of Units per Year :_____

   Percentage of output exported :_____

   Percentage utilisation of current capacity :_____

   Percentage possible expansion in three years :_____

   Any other Products made :_____

   Percentage of Rebates received / retained :_____

3. History of the company

Was an OEM instrumental in starting this Company or Local Facility : Yes / No

If Yes then Who :_____

What volumes have been produced by the local company since startup ?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000

What were the main reasons for this facility being established?

1. _____
2. _____
3. _____
4. _____
5. _____

What were the main reasons for the Catalytic Converter being chosen?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Other important information about the company

_____
_____
_____
_____
_____
_____

4. Current Status of the Industry

What are the main challenges facing the industry at this stage?

1. _____

2. _____

3. _____

4. _____

5. _____

What are the main areas in which South Africa has competitive advantage with regards to the Catalytic Converter Industry over the rest of the world?

1. _____

2. _____

3. _____

4. _____

5. _____

5. Future Prospects for the Industry

What are the main challenges facing the industry in the future?

1. _____

2. _____

3. _____

4. _____

5. _____

What needs to be done to ensure the sustainability of this industry or to overcome the above challenges?

1. _____

2. _____

3. _____

4. _____

5. _____

Would your company or facility be viable if the MIDP were removed? Yes / No

If the MIDP were to be removed what measures could replace it?

1. _____

2. _____

3. _____

4. _____

5. _____

Any further comments on areas not touched by this questionnaire.

Appendix E – World Motor Vehicle Production

1999 WORLD MOTOR VEHICLE PRODUCTION BY MANUFACTURER (units)						
Ranking	MANUFACTURERS	TOTAL VEHICLES	PASSENGER CARS	LIGHT COMMERCIAL VEHICLES[1]	HEAVY TRUCKS	BUS & COACHES
* 1	GM	8 235 065	5 280 802	2 950 592	3 671	—
* 2	FORD	6 664 234	3 498 556	3 107 872	57 806	—
* 3	Toyota	5 495 618	4 340 568	1 118 328	34 170	2 552
* 4	Daimler Chrysler	4 822 609	2 081 359	2 415 549	287 353	38 348
* 5	Groupe VW	4 786 211	4 548 478	225 349	10 660	1 724
6	Fiat-Iveco	2 623 753	2 226 924	283 209	106 917	6 703
7	PSA Peugeot/Citroën	2 515 309	2 182 224	333 085	—	—
* 8	Nissan	2 456 578	1 910 746	523 653	21 110	1 069
* 9	Honda	2 425 001	2 248 654	176 347	—	—
10	Renault	2 345 354	1 982 408	275 510	87 436	—
11	Hyundai	1 969 974	1 552 008	413 651	4 315	—
* 12	Mitsubishi	1 555 345	1 108 499	400 950	43 740	2 156
13	Suzuki	1 520 965	1 213 673	307 292	—	—
* 14	BMW	1 147 420	1 123 265	24 155	—	—
* 15	Mazda	967 312	816 130	148 130	3 052	—
16	Daewoo	966 777	913 365	43 510	7 705	2 197
17	Avtovaz	680 000	680 000	—	—	—
18	Fuji-Subaru	577 060	490 541	86 519	—	—
* 19	Isuzu	520 285	37 630	421 152	59 425	2 078
20	Volvo	503 560	408 990	—	84 659	9 911
21	Proton	275 000	275 000	—	—	—
22	Gas	211 000	103 000	108 000	—	—
23	Tata-Telco	182 125	70 987	111 138	—	—
* 24	Navistar	137 700	—	—	117 700	20 000
25	Paccar-Daf	108 000	—	—	108 000	—
26	Dacia	85 748	69 524	16 224	—	—
* 27	MAN	60 292	—	—	56 145	4 147
* 28	Scania	50 497	—	—	45 795	4 702
29	Porsche	46 167	46 167	—	—	—
30	Samsung	16 263	6 362	—	9 901	—
31	Irusbus	8 250	—	2 031	—	6 219
32	Evobus	6 202	—	—	—	6 202

1. Including minibuses * Includes production in South Africa Source: International Organisation of Motor Manufacturers

WORLDWIDE PRODUCTION OF MOTOR VEHICLES BY COUNTRY

(in 1,000) : 1999/1998 Source: OICA

	Passenger cars			Commercial vehicles			Total		
	1998	1999	% change 99/98	1998	1999	% change 99/98	1998	1999	% change 99/98
Austria	58	69	19.0	12	16	31.8	70	84	21.2
Belgium	340	348	2.5	67	58	-13.1	406	406	0.0
Finland	11	16	48.5	0	0	-8.4	11	16	46.1
France	2,603	2,779	6.7	342	381	11.5	2,945	3,159	7.3
Germany	5,348	5,309	-0.7	379	378	-0.1	5,727	5,688	-0.7
Italy	1,402	1,400	-0.2	290	287	-1.2	1,693	1,687	-0.3
Netherlands	243	255	5.0	27	27	0.0	270	283	4.5
Portugal	174	171	-1.3	27	18	-32.1	201	190	-5.5
Spain	2,216	2,209	-0.3	610	644	5.6	2,826	2,852	0.9
Sweden	368	380	3.2	114	109	-4.8	483	489	1.3
United Kingdom	1,748	1,787	2.2	227	186	-18.2	1,976	1,973	-0.2
EU	**14,511**	**14,722**	**1.5**	**2,096**	**2,105**	**0.4**	**16,607**	**16,827**	**1,3**
Eastern Europe	**2,226**	**2,359**	**6.0**	**279**	**283**	**1.3**	**2,505**	**2,642**	**5.5**
Europe	**16,737**	**17,082**	**2.1**	**2,375**	**2,388**	**0.5**	**19,112**	**19,469**	**1.9**
Turkey	233	206	-11.4	105	73	-30.0	337	280	-17.1
Canada	1,481	1,627	9.8	1,089	1,422	30.6	2,570	3,049	18.6
Mexico	956	1,004	5.0	504	534	6.0	1,460	1,538	5.3
USA	5,554	5,637	1.5	6,448	7,388	14.6	12,003	13,025	8.5
Nafta	**7,992**	**8,267**	**3.4**	**8,041**	**9,344**	**16.2**	**16,033**	**17,611**	**9,8**
Argentina	353	225	-36.3	105	80	-23.6	458	305	-33.4
Brazil	1,271	1,102	-13.2	331	241	-27.2	1,502	1,344	-16.1
China	500	577	15.5	909	990	6.9	1,408	1,567	11.2
India	458	656	43.2	183	204	11.5	641	860	34.2
Japan	8,056	8,113	0.7	1,994	1,780	-10.8	10,050	9,893	-1.6
South Korea	1,625	2,362	45.3	329	481	46.2	1,954	2,843	45.5
Other	456	559	22.5	294	491	67.0	751	1,051	40.0
Australia	338	343	1.5	17	18	3.1	355	360	1.6
South Africa	196	215	9.7	118	112	-5.0	314	327	4.1
TOTAL	**38,213**	**39,707**	**3.9**	**14,801**	**16,201**	**9.5**	**53,015**	**55,908**	**5.4**

Source: (NAAMSA)

SOUTH AFRICA VEHICLE PRODUCTION DATA : 1995 — 1999

	1995	1996	1997	1998	1999	2000[a]	2001[a]
Local sales of domestic vehicles[b]	373 712	381 926	344 472	287 367	266 791	296 500	332 000
Exports	15 764	11 553	19 569	25 898	59 583	78 500	125 200
Total domestic production	389 476	393 479	364 041	313 265	326 374	375 000	457 200
Exports as proportion of total domestic production	4.0%	2.9%	5.4%	8.3%	18.3%	21.0%	27.4%
Imports	22 081	39 150	54 803	64 209	58 968	70 400	81 100
Total local market (including imports)	395 793	421 076	399 275	351 576	325 759	366 900	413 100

Source: (NAAMSA)

a Projected figures b Domestically produced vehicles include cars, light, medium & heavy commercials.

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CONSENT TO SUBMIT RESEARCH REPORT

Consent is herewith given to

.....

Student number ..... to submit his/her Research Report in its final form.

.....
STUDY LEADER

.....
DATE

The participant must get this consent from his/her study leader before he/she may submit his/her Research Report.

Leadership in practice

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