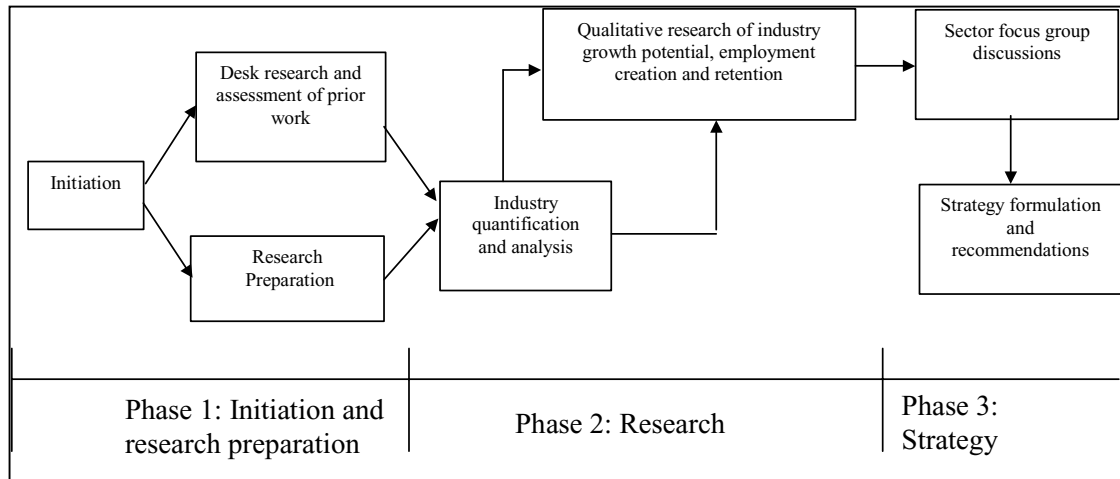


## APPENDIX B – METHODOLOGY

### 8.8 Methodology

The engagement was broken down into a number of main work packages within three main phases. The phases and the work packages that were included in these are depicted in the diagram below.

Figure 163. Work packages in the three phases of the project



The end of each phase was marked with a meeting of the CPG where progress and outputs were evaluated and agreement reached on the next step of the engagement. While phases 1 and 2 can be characterised as research phases, phase 3 was an intense process of consultation and verification with stakeholders to develop recommendations and interventions for the industry and its sectors.

What follows is a brief description of the methodology that was pursued as part of phase 2 and phase 3 of the engagement.

## **Phase 2 - Qualitative and quantitative research**

### **Qualitative phase**

Phase 2 consisted of in-depth qualitative assessments of the sectors identified in Phase 1 of the study. These qualitative studies focussed on the growth, employment creation and employment retention potential of the relevant sector.

This section of the work consisted of triangulated sector-based studies that aimed to deepen research findings across the sectors as well as by theme. The research included in-depth data analysis as well as the accessing of further data sets identified in Phase 1 of the project, further desk research and in-depth face-to-face interviews with key informants with knowledge of the sectors and industry representatives. These studies have resulted in reports that delve in to drivers and impediments to employment trends within Metals and Engineering. These reports were vital resource documents that fed into the Phase 2 findings reports as well as the strategy formulation process of Phase 3.

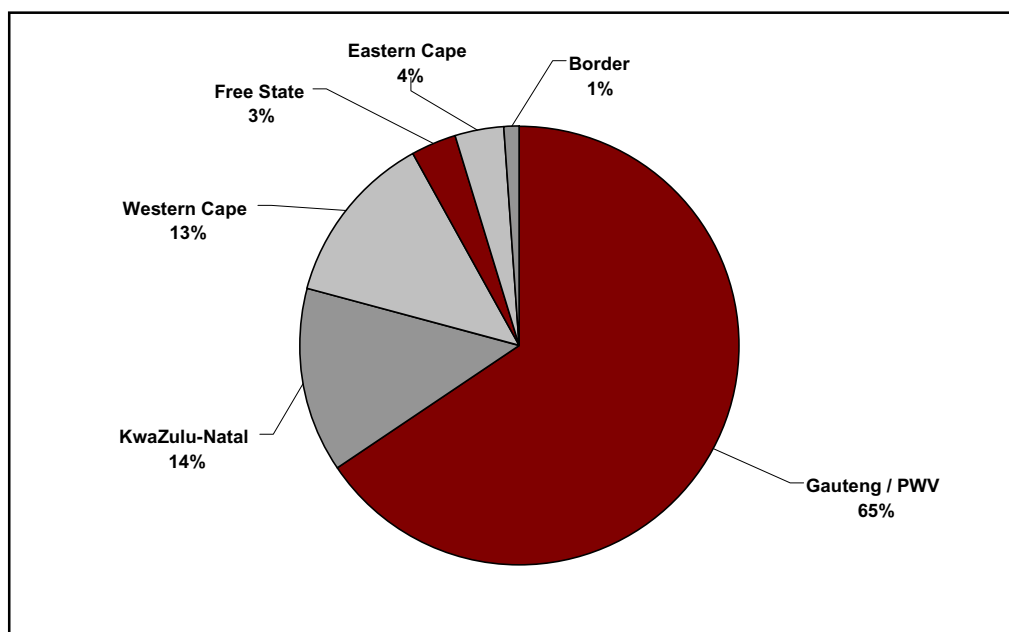
In all, 45 key informant interviews (with relevant Government Departments, industry associations, trade unions and other sector-relevant companies and individuals) and 81 interviews with senior management of companies were completed. These interviews explored the various issues related to industry development and growth, employment retention and creation potential, labour practices, the nature and impact of the regulatory and policy environment, etc. In addition to this figure, interviews were also undertaken with shop-stewards at a number of the plants. A list of interviewees who contributed to this research phase is included as an appendix here.

The interview sample for senior management was stratified, considering factors such as size and sub-sector. Preference was given to the larger companies, in terms of number of employees, as it was felt that these companies have a significant influence on shaping the domestic industries. However, increased strategic importance in terms of jobs, did not mean that there was unequal importance given to the views they expressed. The qualitative nature of this part of the study ensured that there was an even treatment of all views offered to the researchers. It should be kept in mind that the interviews took place within the context of desk research, industry data and the quantitative survey and had as their main aim the provision of texture and nuance to conditions and trends within the sector and to aid interpretation of the survey results.

**Quantitative phase**

The Metals and Engineering Industry Bargaining Council (MEIBC) represents approximately 243,000 scheduled employees<sup>47</sup> who are employed by approximately 8,600 companies throughout South Africa. It has been highlighted that there are a number of smaller companies, which are not represented by the bargaining council. The 243,000 employees, represented within the bargaining council, are located in various regions of the country, which are represented in the figure below. It is clear that the majority of employees are located in the PWV / Gauteng region, followed by the Western Cape and KwaZulu-Natal.

Figure 164: MEIBC employees by region

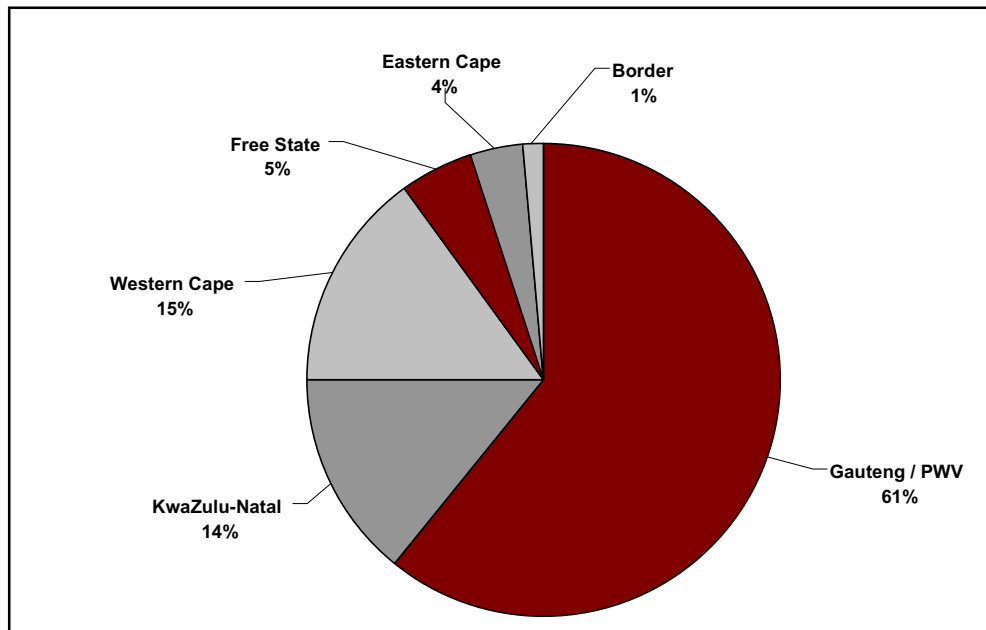


MEIBC data 2002

The 8,600 employer companies are located in the various regions of the country as represented in the figure below. There is a strong correlation between the number of employees and the number of companies in the various regions of the country. The Gauteng region is the most significant employment region, followed by the Western Cape and KwaZulu-Natal.

<sup>47</sup> Permanent employees registered with the MEIBC

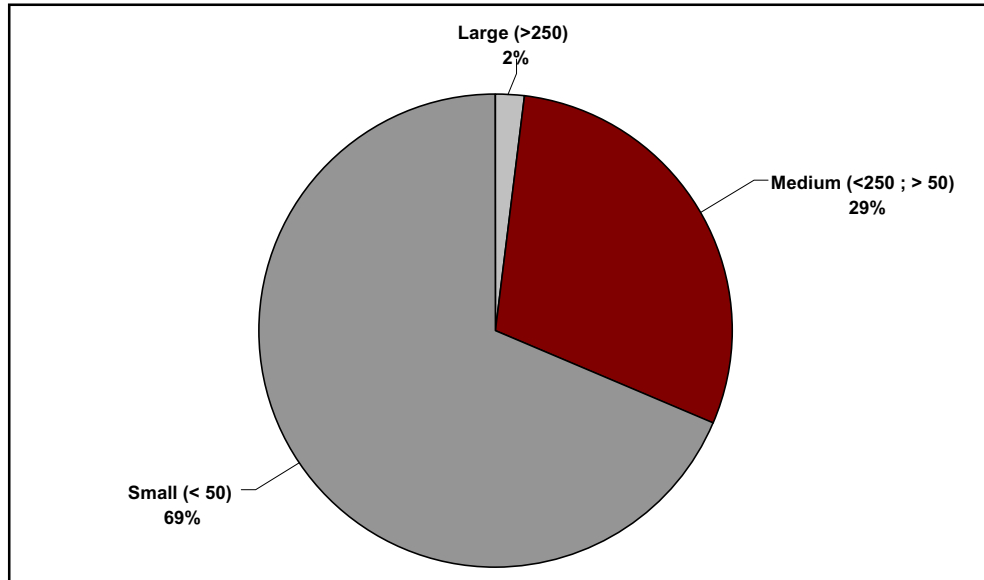
Figure 165: MEIBC Companies by region



MEIBC data 2002

The figure below reflects the representation of companies within the industry by number of scheduled employees. The MEIBC has defined the size of a company in terms of the number of scheduled employees. A 'large' company is defined as one that employs more than 250 scheduled employees in 2002. A 'medium' company is one that employs between 50 and 250 scheduled employees and a small company is one, which employs less than 50 scheduled employees. The figure indicates that there are a large number of 'small' companies in the metals and engineering industry and very few 'large' companies.

Figure 166: MEIBC companies by number of companies



MEIBC data 2002

The metals and engineering industry statistics were used collectively to determine the industry sample size and subsequent stratification. For the purposes of this research, the Metals and Engineering population was defined as consisting of the members of the Metals and Engineering Industries Bargaining Council (MEIBC). The sample size has been stratified across the various South African regions and across the various organisation sizes in proportion to the population weightings. Details regarding the stratification of the survey responses both geographically and by company size among the 5 sub-sectors is summarised in Table 46. The total actual number of responses achieved in the survey was 737.

Table 46: Sample stratification indicating the target number of surveys within the metals and engineering sector

Industry sub-sector stratified by geographical region and number of scheduled employees	Basic metals	Electronics and electrical engineering	Heavy and light engineering	Machinery and equipment	Plastic converters	Metals and engineering (number of respondents in sample)	Metals and engineering (respondents by % in total sample)
Sample size	89	123	211	164	150	737	100.0%
Large (>250)	15	7	11	6	5	44	6.0%
Gauteng / PWV	9	5	6	4	2	26	3.5%
KwaZulu-Natal	2	0	2	0	0	4	0.5%
Western Cape	2	2	2	2	3	11	1.5%
Free State	1	0	1	0	0	2	0.3%
Eastern Cape	1	0	0	0	0	1	0.1%
Border	0	0	0	0	0	0	0.0%
Medium (from 50 to 250)	35	32	72	34	34	207	28.1%
Gauteng / PWV	19	19	43	20	20	121	16.4%
KwaZulu-Natal	7	5	10	5	5	32	4.3%
Western Cape	7	4	11	5	5	32	4.3%
Free State	1	2	4	2	2	11	1.5%
Eastern Cape	1	1	3	1	1	7	0.9%
Border	0	1	1	1	1	4	0.5%
<b>Small (&lt; 50)</b>	<b>39</b>	<b>84</b>	<b>128</b>	<b>124</b>	<b>111</b>	<b>486</b>	<b>65.9%</b>
Gauteng / PWV	23	51	78	76	68	296	40.2%
KwaZulu-Natal	5	11	18	17	16	67	9.1%
Western Cape	6	12	19	18	17	72	9.8%
Free State	2	5	6	7	5	25	3.4%
Eastern Cape	2	3	5	4	3	17	2.3%
Border	0	2	2	2	2	8	1.1%

The stratification across regions and organisation size ensured that the data collection was representative of the companies within each sector.

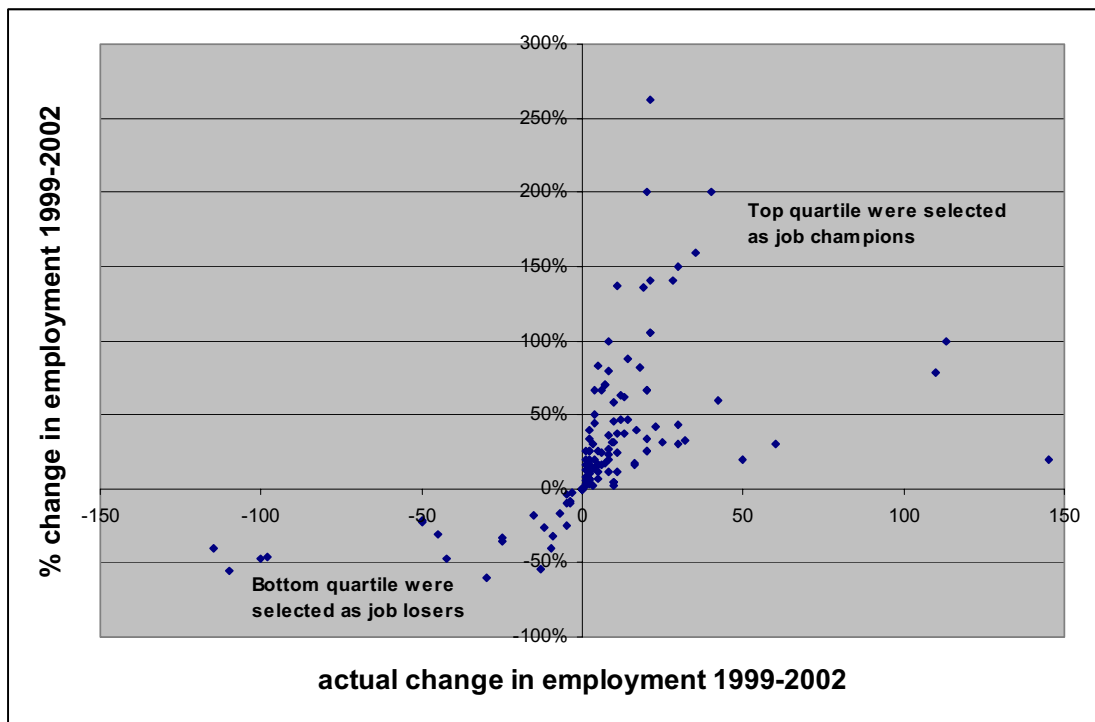
The findings from the quantitative research were written up into sector reports, which were inputs into sector analyses for the Phase 2 deliverables, the findings reports and were used as a database for further analysis and strategy formulation in Phase 3. Each sector within the overarching metals and engineering industry was considered separately in order to extrapolate the employment levels from the sample to the population level. This was done by using a weighted employment intensity average in order to take into account the relative employment intensity of each sector.

The stratification across regions and organisation size ensured that the data collection was representative of the companies within each industry sector.

**Job champions and job losers**

Job champions and job losers were determined by plotting for each company the absolute change in the number of jobs from 1999 to 2002 versus the percentage change in employment from 1999 to 2002 as shown in Figure 167.

Figure 167. Job champions and job losers



The top quartile of the sample in the upper right quadrant were then selected as job champions, while the bottom quartile occurring in the bottom left-hand quadrant were selected as job losers. This enabled the profiles of these two groups of companies to be explored in more detail in each sector.

**BASIC METALS**

The quantitative data collected from the survey respondents was used to infer the total sector statistics. Various secondary data sources were identified which state the employment levels and value of turnover within the industry sub sector. These sources are represented in the table below.

Table 47: Sources of sector turnover and employment for the basic metals sector

Source	2002 Turnover (R)	2002 Employment <sup>48</sup> (number of workers)
IDC	70,296,717,000	51,439
ABSA	64,759,087,000*	45,934

\*CAGR 2001 – 2002 = 4.52 % ABSA

The method used to extrapolate the above employment figures will now be described. Employment levels and turnover values for each respondent surveyed were used to establish characteristic turnover employment intensity values (Turnover / employees). All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full time, permanent part time, casual, temporary, sub contracting (labour brokers) and outsourcing.

Turnover employment intensity (2002) = turnover (2002) / employment (2002)

The companies were sorted and ranked by the employment intensity value characteristic of the organisation. The employment intensity values were graphed in order to identify trends and logical groupings for the sub sector.

Four groups of companies were identified as having similar turnover employment intensity characteristics:

“Labour intensive” - Companies with an employment intensity less than R0.04545 million per employee. Five companies in the survey sample met this criterion.

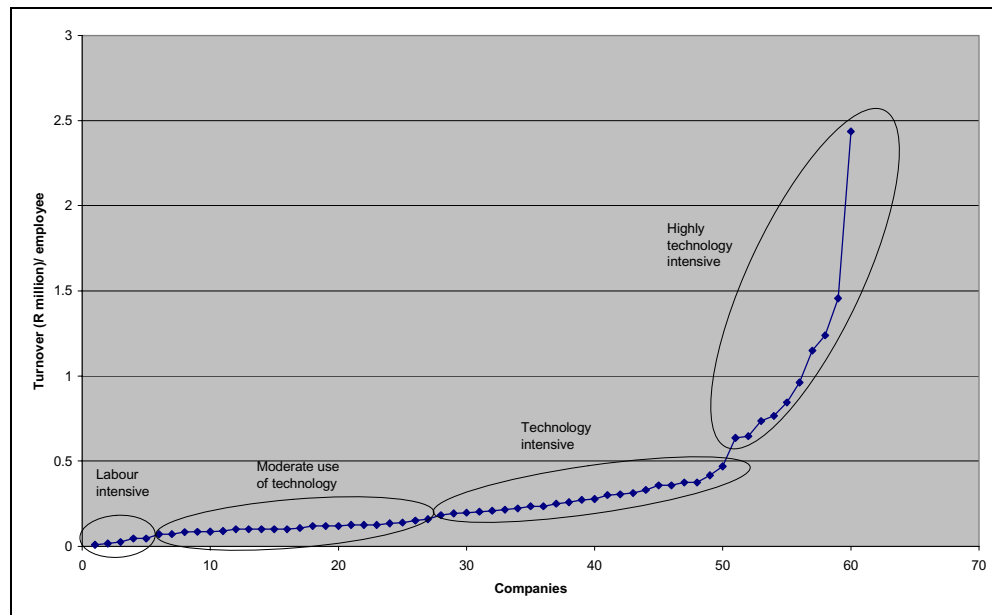
“Moderate use of technology” – Companies with an employment intensity between R0.070 and R0.159 million per employee. Twenty two companies met this criterion.

“Technology intensive” – Companies with an employment intensity between R0.182 and R0.416 million per employee. Twenty two companies met this criterion.

“Highly technology intensive” – Companies with an employment greater than R0.416 million per employee. Eleven companies met this criterion.

<sup>48</sup> Employment is defined as any person in regular or casual employment, including those holding managerial posts

Figure 168: Basic metals sector - employment intensity



The average employment intensity for each of the three groupings was established by taking the sum of the turnover for the group and dividing it by the sum of the employment in the group and weighted by the number of employees within the group as a percentage of the total number of employees in the sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sector.

This value was found to be:

$$0.033 * 0.01 + 0.118 * 0.036 + 0.391 * 0.279 + 1.19 * 0.674 = R 0.902 \text{ million per employee}$$

The various sources of turnover for the sub sector were then used to extrapolate a sector employment figure. The results of the extrapolation are reflected in the table below.

Table 48: Turnover and extrapolated employment

Source	Official 2002 turnover (Rand)	Official employment 2002	Extrapolated employment
IDC	70,296,717,000	51,439	77 917
ABSA	64,759,087,000	45,934	71 779
Average			74 848*

\* Calculated using an employment intensity value of R0.902 million per employee using survey data

The representivity of the sample in terms of turnover is 46%. The employment figure for the sub sector (2002) is 74 848. This figure includes all categories of employment within the sector namely permanent part time, permanent full time, casual, temporary and sub contracted labour.

## ELECTRONICS AND ELECTRICAL ENGINEERING METHODOLOGY

### Electrical engineering

The various official sources used in the extrapolation of this sector’s survey responses are listed below.

Table 2: Sources of sub-sector turnover and employment for the electrical engineering sub-sector

Source	2002 Turnover (R)	2002 Employment (number of employees)
IDC	16,926,560,000	79,340
ABSA	15,124,426,000	68,953
STATS SA	14,629,756,410	78,873

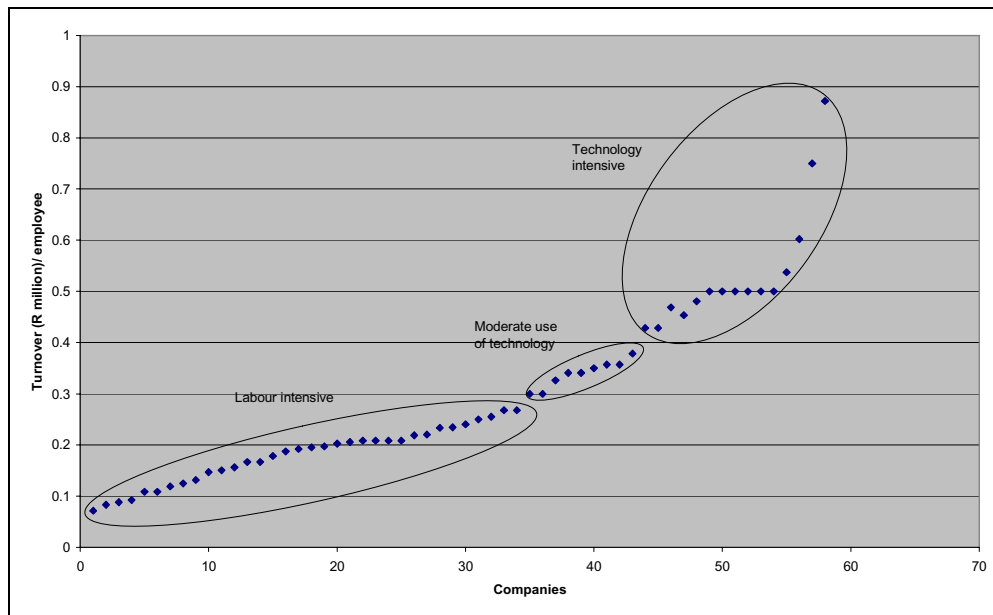
\* CAGR 2001 – 2002 = 1.8% ABSA

The quantitative data was then used to construct an employment intensity graph of the sub-sector. All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full time, permanent part time, casual, temporary and sub-contracted labour.

Turnover employment intensity (2002) = turnover (2002) / employment (2002)

The companies were sorted and ranked by the employment intensity value characteristic of the company. The employment intensity values were graphed in order to identify trends and logical groupings for the sub-sector.

Figure 169: Electrical engineering employment intensity



Three groups of companies were identified as having similar turnover employment intensity characteristics:

*Labour intensive – low technology.* Companies with an employment intensity of less than R 0267 million per employee. Thirty four companies in the survey sample met this criterion.

*Moderate use of technology.* Companies with an employment intensity of between R 0267 million and R0.378 million per employee. Nine companies met this criterion.

*Technology intensive.* Companies with an employment intensity greater than R0.378 million per employee. Fifteen companies met this criterion.

The average employment intensity for each of the three groupings was established and weighted by the number of employees within the group as a percentage of the total number of employees within the sub-sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sub-sector. This value was found to be:

$$0.19 * 0.224 + 0.339 * 0.033 + 0.47 * 0.643 = R 0.360 \text{ million per employee}$$

The various sources of turnover for the sub-sector were then used to extrapolate a sub-sector employment figure. The results of the extrapolation are reflected in the table below.

Table 49: Turnover and extrapolated employment for electrical engineering (updated)

Source	Official turnover (R) 2002	Official employment (number of workers) 2002	Extrapolated employment level 2002*
IDC	16,926,560,000	79,340	46 922
ABSA	15,124,426,000	68,953	41 926
STATS SA	14,629,756,410	78,873	40 555
Average			43 134

\* Using a sub-sector employment intensity of R0.360 per employee, calculated using survey data

It is estimated that the turnover figures provided by the three sources reflected in the table above are representative of the industry sub-sector. As a result, the employment figure for the sub-sector (2002) is 43,134. This figure includes all categories of employment within the sector namely permanent part time, permanent full time, casual, temporary and sub-contracted employees.

#### Electronics

The quantitative data collected from the survey respondents was used to infer the total industry sub-sector statistics. Various secondary data sources were identified which state the employment levels and value of turnover within the industry sub-sector. These sources are represented in Table 50.

Table 50: Sources of sub-sector turnover and employment for the electronics sub-sector

Source	2002 Turnover (Rand)	2002 Employment <sup>49</sup> (number of employees)
IDC	6 527 900 000	20 059
ABSA	6 473 173 000	20 932
STATS SA	6 216 184 533	20 197

\* CAGR 2001 – 2002 = 2.7% ABSA

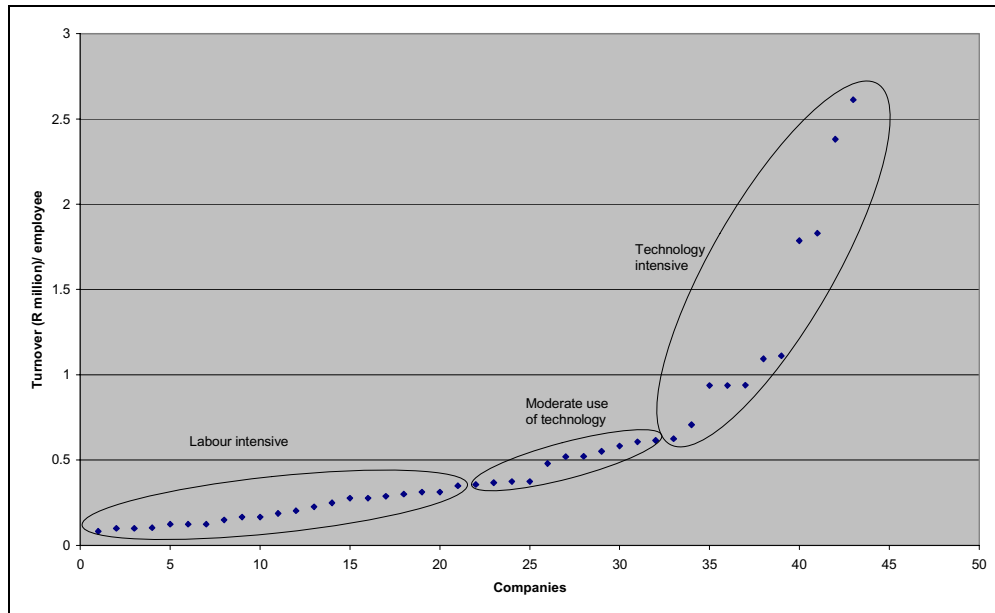
Employment levels and turnover values for each respondent surveyed were used to establish characteristic turnover employment intensity values by calculating the ratio of turnover to employees.

$$\text{Turnover employment intensity (2002)} = \text{turnover (2002)} / \text{employment (2002)}$$

<sup>49</sup> Employment is defined as any person who is in regular or casual employment, including those holding managerial posts.

The companies were sorted and ranked by their employment intensity values. The employment intensity values were graphed in order to identify trends and logical groupings for the sub-sector, as reflected in Figure 170.

Figure 170: Electronic engineering employment intensity



Three groups of companies were identified as having similar turnover employment intensity characteristics:

*Labour intensive – low technology.* Companies with an employment intensity of less than R0.18 million per employee. Twenty one companies in the survey sample met this criterion.

*Moderate use of technology.* Companies with an employment intensity of between R0.31 million and R0.62 million per employee. Eleven companies met this criterion.

*Technology intensive.* Companies with an employment intensity of greater than R 0.625 million. Eleven companies met this criterion.

The average employment intensity for each of the three groupings was established by dividing the sum of the 2002 turnover by the sum of the 2002 employment and weighted by the number of employees within the group as a percentage of the total number of employees within the sub-sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sub-sector. This value was found to be:

$$0.02533 + 0.030064 + 0.29448 = R 0.349 \text{ million per employee}$$

The various sources of turnover for the sub-sector were then used to extrapolate a sub-sector employment figure. The results of the extrapolation are reflected in the table below.

Table 51: Turnover and extrapolated employment for electronic engineering

Source	Official turnover (Rand) 2002	Official employment (number of employees) 2002	Extrapolated employment level 2002*
IDC	6 527 900 000	20 059	18 658
ABSA	6 473 173 000	22 124	18 501
STATSSA	6 216 184 533	20 197	17 767
Average			18 309

*\*Using a sub-sector employment intensity of R 0.349 million per employee, calculated from survey data*

It is estimated that the turnover figures provided by the three sources reflected in the table above are representative of the industry sub-sector. The sample size represented 60% of the population by turnover. The employment figure for the sub-sector (2002) is 18 309. This figure includes the following categories of employment within the sector namely permanent part time, permanent full time, casual, temporary and sub-contracted labour.

## HEAVY AND LIGHT ENGINEERING

This sector was sub divided into metal products and fabrication and the manufacture of automotive components, each of which were extrapolated separately.

### Metal products and fabrication

The quantitative data collected from the survey respondents was used to infer the total industry sub-sector statistics. Various secondary data sources were identified which state the employment levels and value of turnover within the industry sub-sector. These sources are represented in the table below.

Table 52: Sources of sub-sector turnover and employment for the metal products sub sector

Source	2002 Turnover (R)	2002 Employment <sup>50</sup> (number of employees)
IDC	34,240,844,000	107,246
ABSA	29,703,070,000	101,646

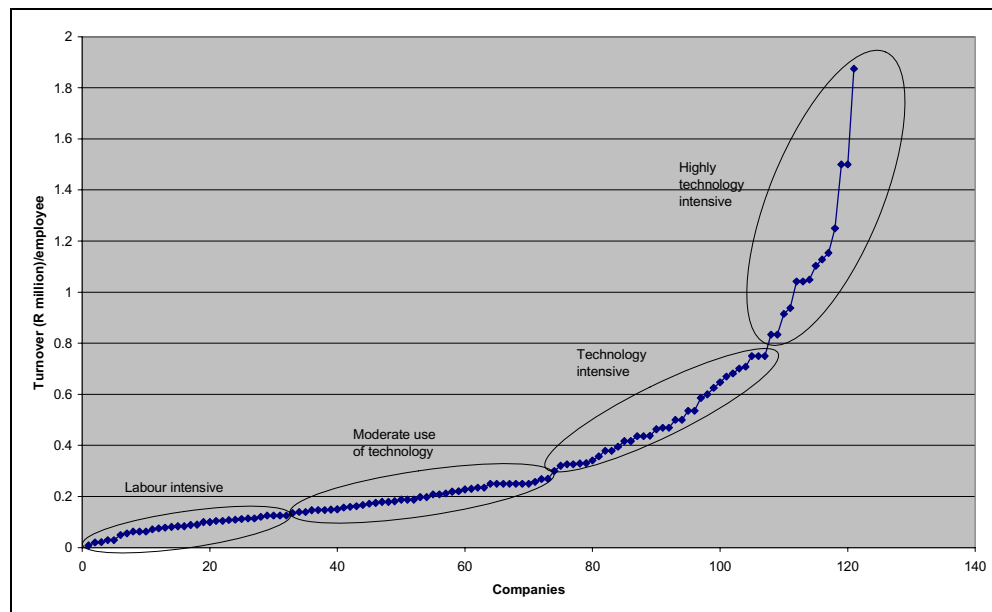
\* CAGR 2001 – 2002 = 0.01% ABSA

Employment levels and turnover values for each respondent surveyed were used to establish characteristic turnover employment intensity values by calculating a ratio of turnover divided by the number of employees. All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full-time, permanent part-time, casual, temporary, sub contracting (labour brokers) and outsourcing.

$$\text{Turnover employment intensity (2002)} = \text{turnover (2002)} / \text{employment (2002)}$$

The organisations were sorted and ranked by the employment intensity value characteristic of the organisation. The employment intensity values were graphed in order to identify trends and logical groupings for the sub-sector.

Figure 171: Metal products and fabrication employment intensity



Four groups of organisations were identified as having similar turnover employment intensity characteristics:

<sup>50</sup> Employment is defined as any person in regular or casual employment, including those holding managerial posts

*Labour intensive – low technology.* Organisations with an employment intensity of less than R 0.125 million per employee. Thirty two organisations in the survey sample met this criterion.

*Moderate use of technology.* Organisations with an employment intensity of between R0.134 and R 0.269 million per employee. Forty one organisations met this criterion.

*Technology intensive.* Organisations with an employment intensity of between R0.300 and R0.750 million per employee. Thirty four organisations met this criterion.

*Highly technology intensive.* Organisations with an employment intensity of greater than R0.750 million per employee. Fourteen organisations met this criterion

The average employment intensity for each of the three groupings was established and weighted by the number of employees within the group as a percentage of the total number of employees in the sub-sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sub-sector.

This value was found to be:

$$0.094 * 0.30 + 0.186 * 0.223 + 0.552 * 0.385 + 1.071 * 0.092 = R 0.381 \text{ million per employee}$$

Obtaining survey responses from a representative sample allows extrapolations to population figures to be made with a confidence of 95% and a level of precision of 8.1%. The various sources of turnover for the sub-sector were then used to extrapolate a sub-sector employment figure. The results of the extrapolation are reflected in the table below.

Table 53: Turnover and extrapolated employment for metal products

Source	Turnover (R) 2002	Official employment 2002	Extrapolated employment level*
IDC	34,240,844,000	107,246	89,843
ABSA	29,703,070,000	101,646	77,937
Average			83,890

\*Using a sub-sector employment intensity of R 0.381 per employee which was calculated using survey data

The sum of the turnover for the organisations within the sample amounts to R4, 650 million or 17% of the population turnover. Thus, using this method, the population employment for the metal products and fabrication sub-sector is 83 890. This figure includes all categories of employment within the sector namely permanent part-time, permanent full-time, casual, temporary and sub contracted labour.

**Automotive components**

The quantitative data collected from the survey respondents was used to infer the total industry sub-sector statistics. All the official data sources utilised above included both the manufacture of automotive components and the assembly of motor vehicles in one category. Since the assembly of motor vehicles is outside the scope of this research, it was not possible to use these data sources. However it was stated within the NAAMSA annual report (2001/2002) that employment within the automotive component sub-sector was approximately 58 500 within the automotive components sub-sector. Turnover within the sub-sector is not accurately known but is approximately R54 billion which includes exports, after sales and direct to OEMs.

*Table 54: Sources of sub-sector turnover and employment for the automotive components sub-sector*

Source	Turnover (R) 2002	Employment (number of employees) – 2002
NAACAM*	54 000 000 000	60 000

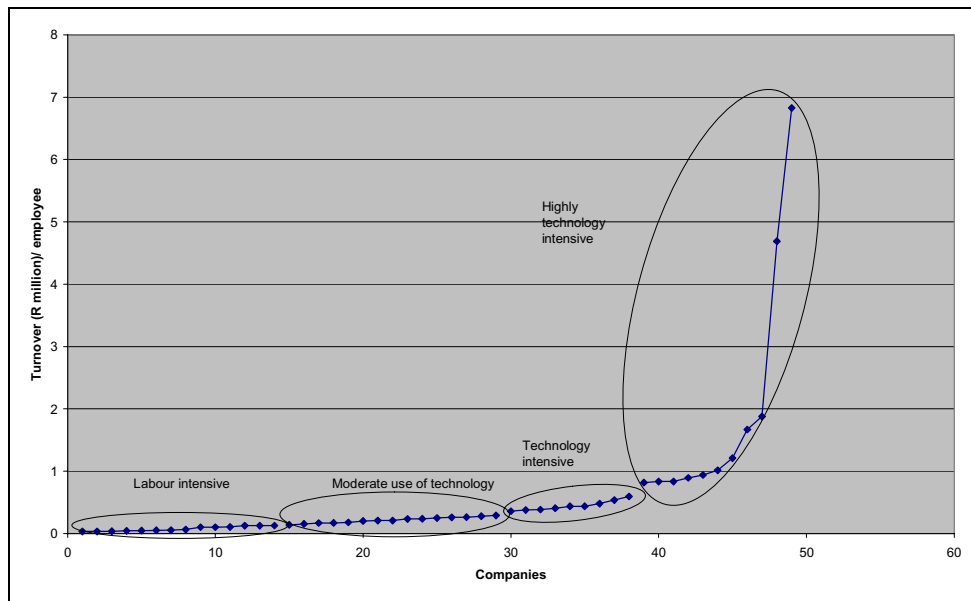
\*Source: Clive Williams. Other official sources combined the manufacture of automotive components with assembly and therefore could not used

Employment levels and turnover values for each respondent surveyed were used to calculate establish characteristic turnover employment intensity values.

$$\text{Turnover employment intensity (2002)} = \text{turnover (2002)} / \text{employment (2002)}$$

The organisations were sorted and ranked by the employment intensity value characteristic of the organisation. The employment intensity values were graphed in order to identify trends and logical groupings for the sub-sector.

Figure 172: Automotive components employment intensity



Four groups of organisations were identified as having similar turnover employment intensity characteristics:

*Labour intensive – low technology.* Organisations with an employment intensity of less than R 0.127 million per employee. Fourteen organisations in the survey sample met this criterion.

*Moderate use of technology.* Organisations with an employment intensity of between R0.138 and R 0.288 million per employee. Fifteen organisations met this criterion.

*Technology intensive.* Organisations with an employment intensity of between R0.357 and R0.595 million per employee. Nine organisations met this criterion.

*Highly technology intensive.* Organisations with an employment intensity of greater than R0.595 million per employee. Eleven organisations met this criterion.

The average employment intensity for each of the three groupings was established by taking the sum of the group's turnover and dividing it by the sum of the employees in 2002 and then weighting this figure by the number of employees within the group as a percentage of the total number of employees in the sub-sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sub-sector.

This value was found to be:

$$0.0720 * 0.398 + 0.211 * 0.274 + 0.423 * 0.159 + 3.17 * 0.169 = R 0.690 \text{ million per employee}$$

The various sources of turnover for the sub-sector were then used to extrapolate a sub-sector employment figure. The results of the extrapolation are reflected in the table below.

Table 55: Turnover and extrapolated employment

Source	Turnover (R) 2002	2002 Employment (number of employees)	Extrapolated employment level*
NAACAM	54 000 000 000	60 000	78 258

\* Using sub-sector employment intensity of R 0.690 million per employee which was calculated using survey data

The representivity of the survey sample, in terms of turnover, is 10%. The employment figure that was obtained using turnover as an extrapolation anchor is 78,258. This figure includes all categories of employment within the sector namely permanent part-time, permanent full-time, casual, temporary and sub-contracted labour.

## MACHINERY AND EQUIPMENT

The quantitative data collected from the survey respondents was used to infer the total sector statistics. Various secondary data sources were identified which state the employment levels and value of turnover within the sector.

Table 56: Sources of sector turnover and employment for machinery and equipment sub-sector

	2002 Turnover (Million Rand)	2002 Employment <sup>51</sup> (number of employees)
IDC	31 283,452	80,963
ABSA	30 171,910*	77,698

\*Using a CAGR from 2001 – 2002 of 0.96% (ABSA)

Employment levels and turnover values for each respondent surveyed were used to establish characteristic turnover employment intensity values. All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full time, permanent part time, casual, temporary, sub contracting (labour brokers) and outsourcing.

Turnover employment intensity (2002) = turnover (2002) / employment (2002)

<sup>51</sup> Employment is defined as any person in regular or casual employment, including those holding managerial posts

The organisations were then sorted and ranked by the employment intensity value characteristic of the organisation. The employment intensity values were graphed in order to identify trends and logical groupings for the sector.

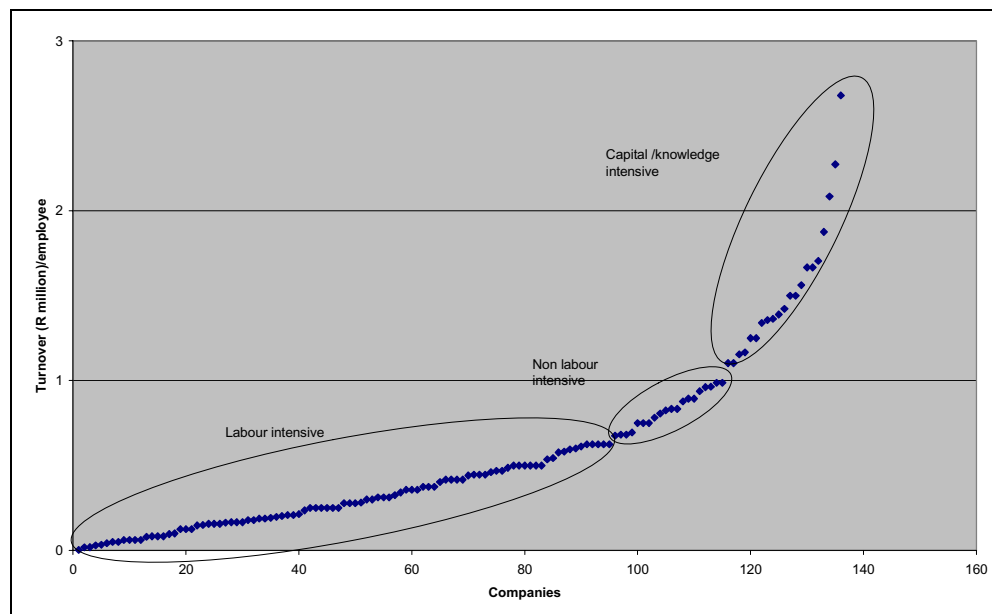
Three groups of organisations were identified as having similar turnover employment intensity characteristics. The groups were chosen according to the knowledge intensive nature of the sub-sector.

*Labour intensive.* These organisations were defined to have an employment intensity of less than R0.625 million per employee. Ninety five organisations in the survey sample met this criterion.

*Non labour intensive.* These organisations were defined to have an employment intensity between R0.675 and R0.98 million per employee. Twenty organisations met this criterion.

*Capital/ knowledge intensive.* These organisations were defined to have an employment intensity of greater than R0.98 million per employee. Twenty-one organisations met this criterion.

Figure 173. Employment intensity groupings for the Machinery and equipment sector



Source: Bentley West survey, 2003

The sum of the turnover divided by the sum of the total employment for each of the three groupings was established, creating an employment intensity ratio and this value was then weighted by the number of employees within the group as a percentage of the total number of employees in the sub-sector. The resultant group weightings were then summed to obtain a representative turnover employment intensity ratio for the sector that takes into account capital intensity.

This value was found to be:

$$0.183 * 0.682 + 0.861 * 0.177 + 1.47 * 0.141 = R 0.485 \text{ million per employee}$$

The various sources of turnover for the sector were then used to extrapolate a sector employment figure.

Table 57: Turnover and extrapolated employment (updated)

Source	Official employment 2002	Extrapolated employment level*
IDC	80 963	64 428
ABSA	77 698	62 138
Average		63 284

\* Using a sector employment intensity of R 0.485 million per employee

The representivity of the sample in terms of turnover was 34%. The 2002 extrapolated total employment figure for the sector is 63,284, which is representative of all categories of employment.

### PLASTIC CONVERTERS

The quantitative data collected from the survey respondents was used to infer the total industry sector statistics. Various secondary data sources were identified which state the employment levels and value of turnover within the industry sector. These sources are represented in the table below.

Table 58: Sources of sector turnover and employment

Source	2002 Turnover (R)	2002 Employment <sup>52</sup> (number of employees)
<b>IDC</b>	15,130,141,000	57,056
<b>ABSA</b>	12,169,490,000*	67,686
<b>PFSA</b>	17,000,000,000	32,000

\*Using a CAGR of 1% for 2001-2002 (ABSA)

The table reflects that employment and turnover values vary considerably between the PFSA and IDC, ABSA and STATS SA sources.

<sup>52</sup> Employment is defined as any person in regular or casual employment, including those holding managerial posts

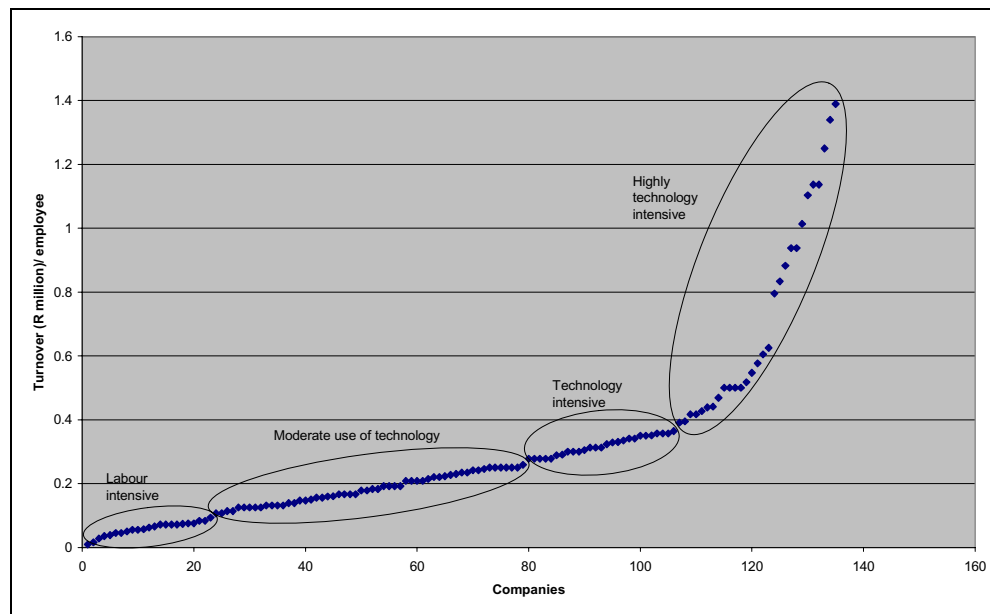
## Employment intensity method

Employment levels and turnover values for each respondent surveyed were used to establish characteristic turnover employment intensity values by calculating the ratio of turnover to number of employees. All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full-time, permanent part-time, casual, temporary, sub contracting (labour brokers) and outsourcing.

$$\text{Turnover employment intensity (2002)} = \text{turnover (2002)} / \text{employment (2002)}$$

The organisations were sorted and ranked by their employment intensity values and are reflected in Figure 174. Fourteen organisations did not provide turnover figures and were removed from the analysis. The employment intensity values were graphed in order to identify trends and logical groupings for the sector.

Figure 174: Plastic converters employment intensity



Three groups of organisations were identified as having similar turnover employment intensity characteristics:

*Labour intensive – low technology.* Organisations with an employment intensity of less than R 0.093 million per employee. Twenty three organisations in the survey sample met this criterion.

*Moderate use of technology.* Organisations with an employment intensity between R 0.106 and R 0.2587 million per employee. Fifty six organisations met this criterion.

*Technology intensive.* Organisations with an employment intensity of between R 0.277 and R0.364 million per employee. Twenty seven organisations met this criterion.

*Highly technology intensive.* Organisations with an employment intensity of greater than R 0.390 million per employee. Twenty nine organisations met this criterion.

The average employment intensity for each of the four groupings was established and weighted by the number of employees within the group as a percentage of the total number of employees in the sector. The resulting group weightings were then added together to obtain a representative turnover employment intensity ratio for the sector.

This value was found to be:

$$0.059 * 0.127 + 0.187 * 0.344 + 0.319 * 0.210 + 0.712 * 0.319 = R 0.366 \text{ million per employee}$$

The various sources of turnover for the sector were then used to extrapolate a sector employment figure. The results of the extrapolation are reflected in Table 59.

Table 59: Turnover and extrapolated employment from survey

Source	Official 2002 turnover (R)	Official employment 2002	Extrapolated employment level*
IDC	15,130,141,000	57,056	41,296
ABSA	12,169,490,000	67,686	33,215
PFSA	17,000,000,000	32,000	46,400
Average			40,304

\*Using a sector employment intensity of R 0.366 million per employee

Using this method, it can be stated that employment in the plastic converters sector is 40 304 in 2002.

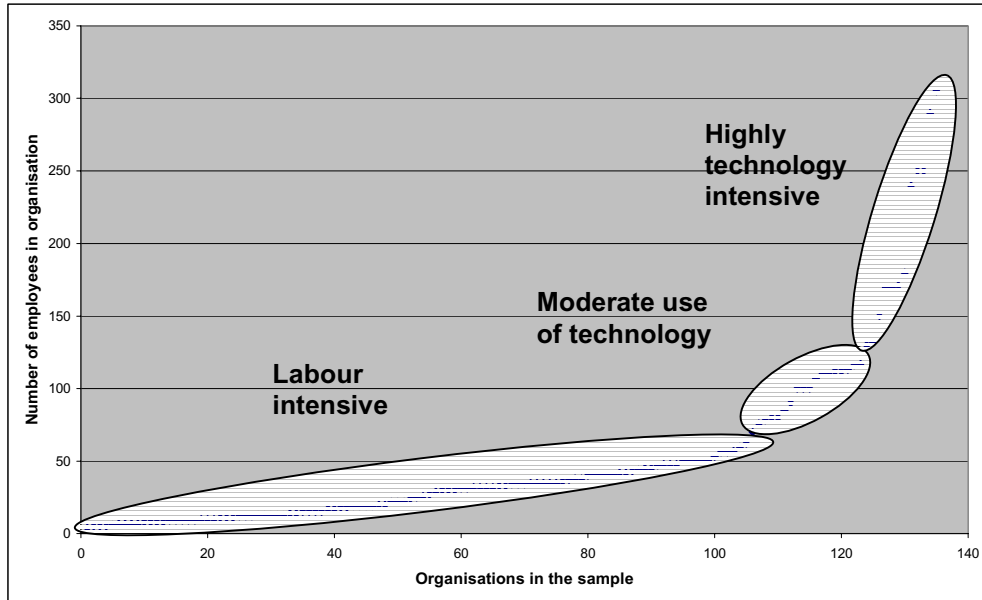
**Average number of employees per company method**

A second method to establish sector employment figures was used. In this method an employment level for each respondent surveyed was used to establish an organisation employment intensity figure for the organisation in question. All categories of employment were included in the employment figure used in the formulation of the ratio. These employment categories include permanent full time, permanent part time, casual, temporary, sub contracting (labour brokers) and outsourcing.

$$\text{Organisation employment intensity (2002)} = \text{employment (2002)} / \text{Number of organisations (2002)}$$

The organisations were sorted by the organisation employment intensity value that was established. The organisation employment intensity values were graphed in order to identify trends and logical groupings for the sector.

Figure 175: Plastic converters organisation employment intensity



Three groups of organisations were identified as having similar organisation employment intensity characteristics:

*Small organisations.* Organisations employing less than 50 employees. Ninety nine organisations in the survey sample met this criterion.

*Medium-sized organisations.* Organisations employing between 50 and 250 employees. Thirty two organisations in the survey sample met this criterion.

*Large organisations.* Organisations employing greater than 70 employees. Five organisations in the survey sample met this criterion.

The average employment intensity for each of the three groupings was established and weighted by the number of organisations within the group as a percentage of the total number of organisations in the sector. The resulting group weightings were then added together to obtain a representative organisation employment intensity ratio for the sector.

This value was found to be:

$$22 * 0.73 + 90 * 0.19 + 180 * 0.08 = 47 \text{ employees per organisation.}$$

The Plastic Federation of South Africa (PFSA) stated that there were approximately 1050 organisations within the sector. This value was then used to extrapolate an employment figure for the sector. The results of the extrapolation are reflected in the table below.

Table 60: Extrapolated sector employment

Source	Official 2002 number of companies	Official employment 2002	Extrapolated employment level*
PFSA	1050	32,000	49,350

*\*Using a sector employment intensity of 47 employees per organisation*

Using this method, it can be stated with 95% confidence that employment for the plastic converters sector is 49 350 employees with a variance of 8.0% or 3 948 employees.

## **METALS AND ENGINEERING SECTOR**

The extrapolated employment figures from the various sectors was summed to obtain a Metals and engineering employment figure of 401 938 employees in 2002.

### **Phase 3 - Strategy process**

This intense part of the engagement process had two main goals; a process of data verification and the development of strategy recommendations for the industry. The process included further interviews with key stakeholders, sector-based focus groups with stakeholders and a strategy workshop with the CPG.

This process of consultation was vital to assist data verification and fine tune strategies for the industry. In all, six focus groups were held (with the heavy and light engineering sector having two focus groups; one for automotive components and one for metal products and fabrication). The focus groups provided an opportunity to present the findings of the research, verify what had been identified as the key drivers and impediments to growth and employment creation and then workshop these findings' implications with the view to develop strategic intervention recommendations. The focus groups were attended by trade union, industry and government representatives and ensured that all aspects of the sectors were taken into consideration in the formulation of strategy recommendations.

Phase 3 also included a strategy workshop with members of the CPG. This workshop reviewed the key findings of the research and explored how these could be incorporated into

a vision of the metals and engineering industry and its sectors. The workshop provided an opportunity for stakeholders to input on the engagement's preliminary recommendations.

The outcome of this consultation process (built on Phase 1 and 2 findings) is a Findings and Recommendations report. This report consists of an overarching chapter that outlines key trends and the main drivers and impediments to growth and employment creation in the industry. It also includes the fundamental output of the engagement; industry recommendations and interventions. The report includes further chapters that focus on sector-specific findings and recommendations that are unique or of particular relevance to each sector.