

order to have access to their client lists and order books. Initiatives such as TISA's attempt to identify key markets as well as to lead trade missions will be of critical importance to the future growth of the sector.

4.3 Research and development

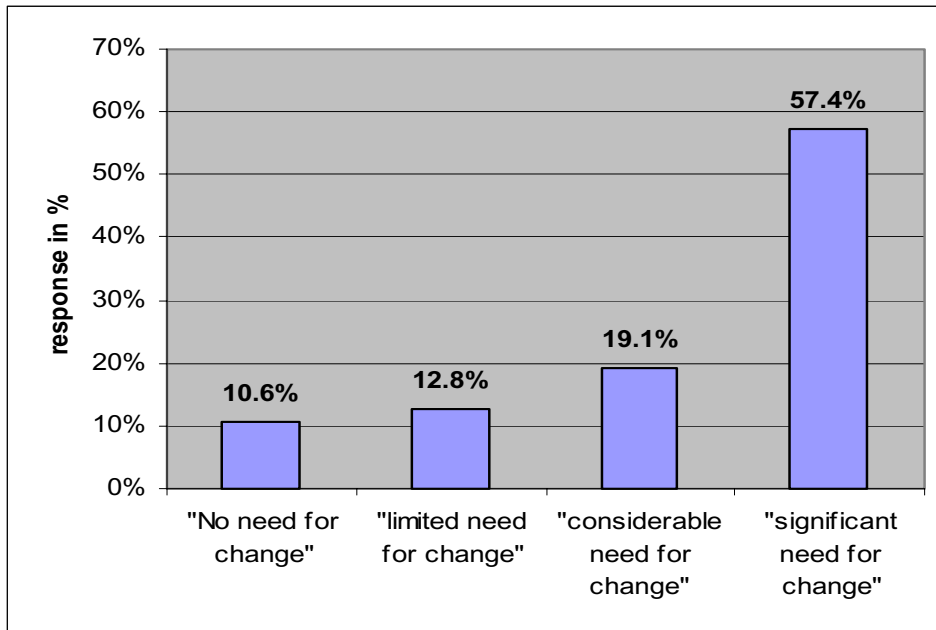
Research and development has been a key driver in the success of South African manufacturers who have been able to compete in the international export markets. Research and development has been driven by two trends:

- Domestic R&D capabilities that are often the legacy of considerable state investment into parastatal or defence related industries
- Technology sharing that has resulted from FDI into or strategic co-operative agreements between companies in the electronics and electrical engineering sector

However, the R&D process is capital intensive and therefore restricts the level of new entrants into the market. Simultaneously, R&D requires high levels of domestic expertise in the areas of design and while there are mixed feelings as to the current availability of skills in this area, it is clear that an insufficient supply of skills would result in South Africa losing its competitive edge in this arena.

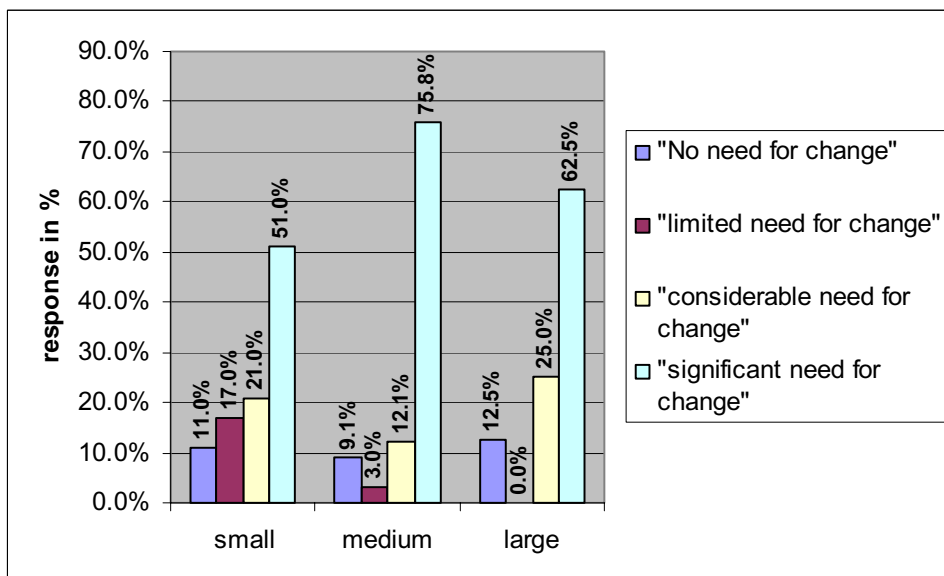
The importance of R&D driven innovation to the growth of the sector is reflected in the figures below which show the emphasis manufacturers place on innovation.

Figure 65. Perceived need for change with respect to innovation of products among the electrical and electronic sub-sector



Given their higher exposure to export markets, it is unsurprising that a higher percentage of medium-sized companies perceive a “significant” need for change with regard to product innovation.

Figure 66. Perceived need for change with respect to innovation of products among small, medium and large companies



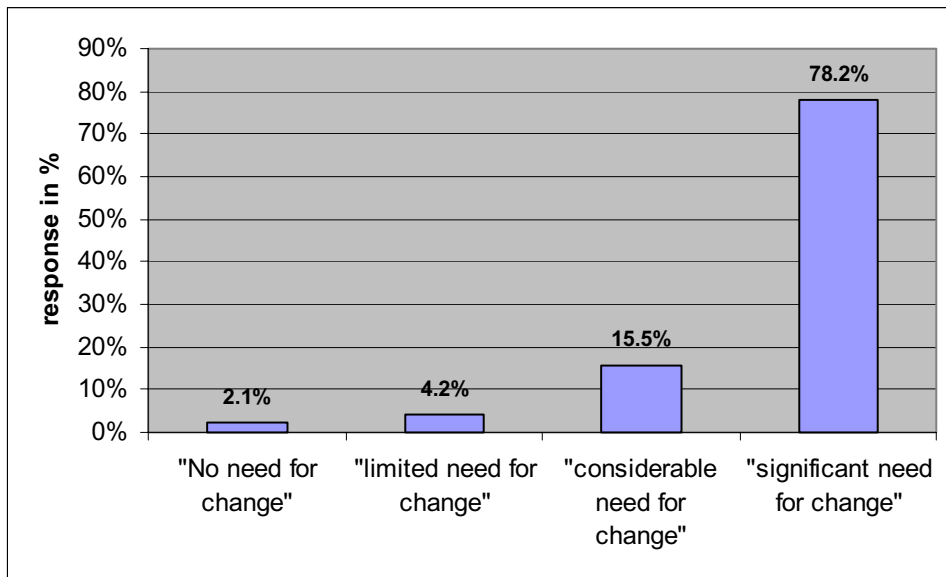
4.4 Labour legislation

Respondents consistently raised labour legislation as increasing the risks of employment, particularly of a short-term or contractual nature. This risk potentially has a dampening effect on the sector, as its risk-averse stance means that it does not capitalise on potential opportunities and potentially lessens entry points into the labour market. Most respondents cited concerns that the existing labour legislation restricted their ability to increase capacity to capitalise on short-term opportunities. Although the legislation makes allowance for fixed-term contracts as well as the possibility of employing sub-contractors²⁴ for specific periods of time, it appeared that the legislation has increased perceptions of the risk associated with employment. The argument presented by employers has been that even if they operate within their legal rights, they nevertheless run the risk of ex-employees attempting to use procedural components of the Labour Relation Act (LRA) to extract compensation upon termination of short-term contracts. Accordingly, they choose to avoid employing extra personnel to pursue what may be once-off opportunities, preferring instead to increase overtime to meet demand. This is a major concern in the sector; particularly within the electrical machinery sector where orders tend to be “lumpy”, requiring labour for defined periods of time. The truth of this position is given some support from the South African Labour Force Survey²⁵, which shows that 87% of employees in the sector are permanent employees. Looked at from another angle, it would suggest that it is indeed the case that very few employers are increasing capacity to meet once-off orders by hiring temporary or casual workers.

²⁴ An additional constraint noted by some respondents was that labour brokers did not offer sufficiently skilled individuals to make it viable to follow this route.

²⁵ NB: This data is drawn from a total respondent base of 146 individuals. Accordingly the base is too large to make any conclusive statements and the statistics in this section are presented for largely illustrative purposes, to give a sense of the current ‘state-of-play’ in the sector.

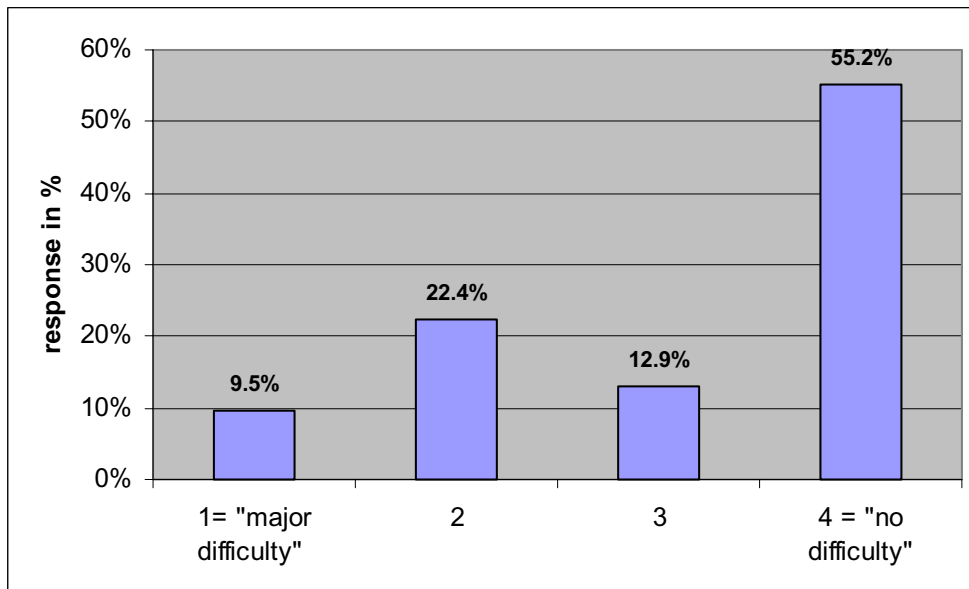
Figure 67. Perceived need for change with respect to labour legislation in the electronics and electrical sector



4.5 Skills

In both the qualitative and quantitative components of the research, responses to questions of a skills shortage were mixed, with no clear trend emerging. However, it is clear that a substantial number of companies experience some or considerable difficulty accessing the skills required for their operations.

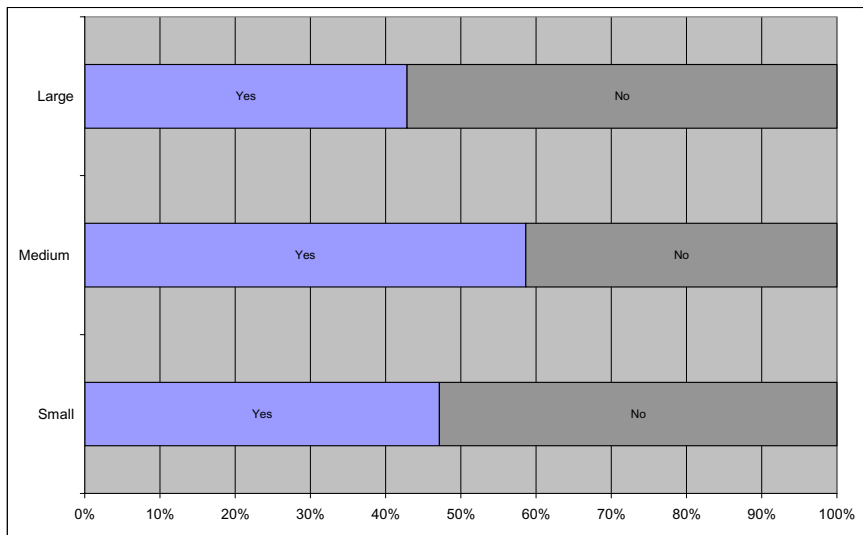
Figure 68. Difficulty experienced when accessing appropriate skills (expressed as a % of the total sample)



This is of particular concern when one considers that the companies that are currently competing successfully are doing so on the basis of their relative skill intensity. A shortage of skills, either currently or in the future, is exceedingly likely to have a dampening effect on the employment creation possibilities of the sector.

It is in this context that the efficacy of the Merseta is critical to the future growth of the sector. Again, respondents have had mixed feelings on the efficacy of the Merseta. However, it is clear that for such a critical institution, the majority of respondents in the sector do not view it favourably (Figure 69). Nevertheless given the relative youth of the institution, it is probably fair to say that the rating reflected below is not entirely negative.

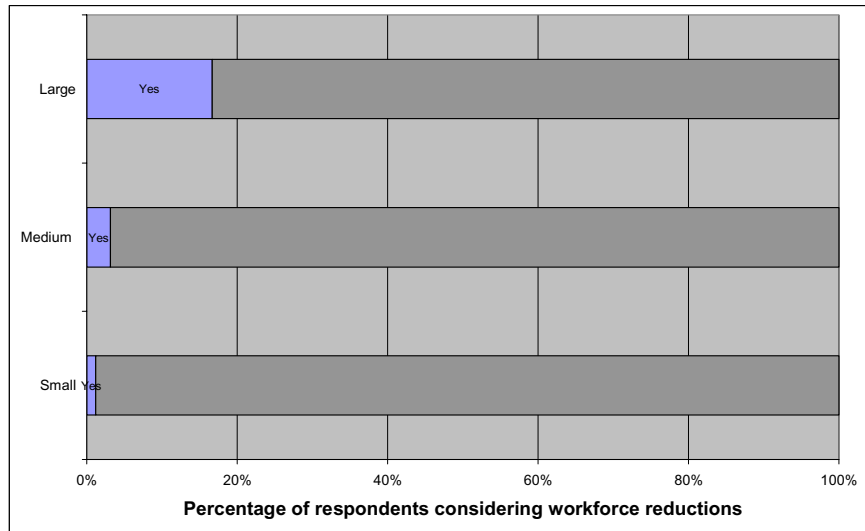
Figure 69: Respondent's view on whether the Merseta is effective



The electronics and electrical engineering sector has clearly experienced considerable turbulence over the past 7 years. Much of this turbulence has been driven by shifts in industrial policy that has seen increasing competition in the domestic market, as well as changes in government and parastatal procurement policy. There seems little doubt from the research that this policy has resulted in the demise of many large manufacturers that grew under the umbrella of a protected economy. Nevertheless, the sector has achieved some level of stability based on companies that are either servicing particular domestic markets or have been able to move into the international arena offering design-intensive products. The net result has been that employment has grown slightly across the sector.

The future for employment in the sector is mixed. Some large employers are anticipating retrenchments in the near future and given that they account for 58% of the jobs in the sector, this is likely to have a dampening effect on employment.

Figure 70: The extent of organisations considering workforce reductions in the short-term (1 year)



However, as can be seen in the four figures below, the expectations for both turnover and export growth continue to be positive over the next 3 year period, which may result in some employers expanding their employment over the medium term.

Yet, the impact of these projections on employment is difficult to predict. There is a definite sense in the sector that there is a risk associated with employment. However, companies that are managing to compete successfully are leveraging off their own innovation capacity in order to offer niche or customised products to mid-sized international markets. Much of this kind of manufacture requires skilled labour, which is not readily available from sub-contractors. Thus companies are caught in a double-bind of needing to expand capacity in order to serve emerging market opportunities but being simultaneously reluctant to employ because of perceived constraints emerging from labour legislation.

The sector is likely to continue along a path of servicing the domestic market in instances where:

- The products are unique to South African requirements for example pre-paid metering systems

- Flexibility is required by customers that can be achieved because South African companies can offer lower production runs
- Companies enjoy competitive advantage for instance in electrical machinery for the mining sector

Domestic market share is likely to continue to be lost in areas where products are mass-produced and South Africa simply does not enjoy sufficient economies of scale to compete on either a cost or a quality basis. As companies are displaced from these markets by imports they will:

- Move increasingly into service-oriented offerings built around imported products
- Seek to consolidate product offerings that can compete in the international marketplace. These are likely to be fairly knowledge intensive and or customised products that allow companies to leverage off South Africa's engineering intellectual endowment and its relatively cheap labour rates.

Furthermore recent balance of trade trends indicate that domestic market share might be lost in lower volume products over the medium-term unless efforts are made to strengthen the capacity of the sector to respond.

Thus, both the maintenance of domestic market share and export growth is going to require considerable investment in the creation and renewal of South Africa's intellectual capital.

In summary, growth in employment in this sector will be dependent on the leveraging of the following drivers of employment;

- The continued success of small companies, which recently have provided the majority of employment growth in the sector
- A unique combination of skills and an ability to produce flexibly ('lower volume, higher design business) amongst some industries (such as electrical machinery)
- Developing products that are based on unique R&D capabilities to meet specific customer requirements
- Export growth (particularly into Africa)
- Advantageous utilisation of relatively cheap skilled labour

On the other hand the research has identified the following potential impediments to job creation in this sector:

- The decline of tariff protection, which has affected a range of products (in particular in standardised products such as lamps) and reduced market share
- The fact that local companies have failed to fully exploit new domestic markets (in particular cellular telephony)
- The decline in parastatal and government spending, which continues to negatively affect the domestic industry
- A shift in government procurement strategies away from domestic manufacturers constitutes a major impediment to job growth in the sector
- The negative perception of labour legislation by many companies, resulting in a declining percentage of permanent employees in favour of more flexible working arrangements
- Difficulties in filling skilled positions and a mixed reaction to the role the Merseta can play in alleviating this problem.

5 KEY ISSUES FOR CONSIDERATION IN STRATEGY AND POLICY FORMULATION

In the preceding sections we have discussed in substantial detail the parameters of the electronics and electrical engineering sub-sectors. We have reviewed the trends in the sector; attempting to both explain what drives those trends as well as what impedes employment creation in the sector. In the following section we turn to elaborating what sort of strategy should be adopted to grow the employment creating potential of the sector. This section will summarise the previous findings' sections in order to identify the key issues that must be taken into account when devising an employment creation strategy for the sector.

This sector is much like the metals and engineering industry, in that both have experienced employment loss over the last 3 years. This employment loss has been somewhat offset by increases in atypical employment as well as general employment growth in small and medium sized companies.

The major victims of employment loss have been employees in large companies and/ or employees in companies that were focused on mass-produced undifferentiated products, which rendered them unable to generate sufficient economies of scale to compete successfully.

Companies within the electrical engineering sub-sector that have leveraged a strong engineering design capability and focused on low-volume, customised products for niche markets have been more successful in creating employment. This is due to the fact that such products inherently have limited economy of scale advantages, which has enabled these companies to avoid head on price competition with large scale multinational players. Thus, they have been able to defend their domestic market share and grow their exports.

Successful companies placed emphasis on research and development and acquired strong engineering design skills. These design skills are cost competitive with developed countries and enable domestic companies to create and sustain a competitive advantage due to innovation and customisation. The cost of skills required for assembly is also competitive, which has enhanced the competitiveness of companies involved in this area.

However the recent change in the balance of trade and employment performance of the electrical machinery and components sub-sector coupled to ABSA predictions that the South African sector will grow more slowly than global output, suggests that the sub-sector may come under increasing import competition in the near future. Given that the sub-sector is both the most important contributor to employment in the sector and that it is strongly reliant

on domestic sales, this confluence of trends may hold negative implications for the possibilities of employment creation in the sub-sector.

Increases in domestic demand may provide some impetus for employment growth in the sector. Sources of demand are likely to include:

- The Second Network Operator providing impetus to the radio, TV and communication equipment industry
- Increased expenditure in the telecommunications and rail sectors totalling R7billion each in the coming financial year may that well provide substantial impetus to the sector²⁶. This is particularly important for the electrical machinery and components sector, which stands to benefit from investments in new signalling equipment and the electronics industry which will benefit from an increased demand in circuit breakers
- The ongoing low-cost housing initiative will also impact positively on demand for the electronic sub-sector's output specifically in the area of circuitry, light fittings and plug points. This initiative will in turn stimulate the demand for household appliances over the medium-term.

However, given the current procurement trends and the absence of procurement practices that support domestic manufacture; a substantial proportion of current and future expenditure may not benefit South African employment levels or, in a worst case scenario, provide the critical mass required for an importer to displace domestic manufacture in particular products.

Export growth has provided additional revenues to the sector. However, our survey has shown that exports are the domain of a relatively small percentage of the overall sector and even amongst those companies that export; export revenues are a relatively small percentage of overall turnover. Thus if export is to be a serious growth path for the sector, substantially more will have to be done to assist companies in developing the capabilities required to be exporters.

As the electronics and electrical engineering sector currently stands, it has:

- Gone through substantial restructuring but, on aggregate has not suffered as severe a decline in employment as for instance the machinery and equipment sector, and is therefore probably fairly well-positioned for employment growth given the appropriate protection and stimulus;

²⁶ I-Net Bridge 21 February 2003.

- A strong intellectual capital base that resulted from considerable investments in the development of engineering capabilities. This base is currently in place although it is being eroded by increasing immigration of engineering graduates and reluctance on the part of employers to afford graduates work opportunities.
- A history of innovation that has both developed new markets, but has had the intangible benefit of putting South African manufacturing 'onto the map'
- A strong manufacturing base
- Increasing competition in arenas where it has conventionally enjoyed competitive strength, notably the electrical machinery and components sub-sector, which if left unaddressed may result in the opportunity for employment growth being reversed into more substantial losses.

Simply put, if left alone the sector may enter a decline, while if appropriately supported it may become an important contributor of employment and innovation. It is to the specificities of interventions required that we now turn.

6 AN EMPLOYMENT CREATION STRATEGY

6.1 Introduction

A co-ordinated, holistic strategy aimed at retaining and growing the current level of employment within the sector is recommended, which will in turn facilitate the achievement of the overall vision for the sector, which is as follows:

The medium to long term vision for the electrical engineering and electronics sector is to stem the employment loss and position the sector to achieve future growth and competitiveness by focusing on low volume, differentiated products and services in order to defend and grow domestic market share whilst growing the level of value-added exports, increasing horizontal and vertical collaboration and a focusing on innovation.

Accomplishing this vision will require strengthening the drivers and overcoming the impediments identified in the above report. This requires the pursuit of strategic objectives in the following four areas:

1. Skills

- a. Enhancing the development of technical design skills**
- b. Enhancing managerial skills**

2. Manufacturing

- a. Stimulate product and process innovation**
- b. Support for transition strategies for companies at risk**
- c. Development of a professional outsourcing sector**

3. Demand

- a. Proactively manage and stimulate domestic demand processes**
- b. Consider introducing SABS compliance requirements for certain imported products**
- c. Grow exports by adopting a market-oriented export approach**

4. Operating environment

- a. **Protect and grow ‘centres of excellence’**
- b. **Encourage collaboration with the formation of vertical and horizontal partnerships**
- c. **Manage the transformation of the labour market and address impediments to employment creation**

Each intervention identifies at an operational level, the stakeholders necessary to achieve a particular strategic objective and the roles of the various entities in achieving that intervention. The proposed strategic objective and their associated interventions aim to complement the various initiatives and interventions already in place. Such mechanisms are identified and specific recommendations aimed at modifying and improving these are made where relevant.

6.2 Skills

6.2.1 Enhancing the development of technical design skills

Much of this sector’s ability to maintain domestic market share and grow export markets has resulted from its intellectual capital base. The high-tech nature of the sector, combined with the fact that domestic players who have focused on innovative offerings rather than mass produced products have been more successful at growing employment, confirm that it is critical to address the current skills shortage if the sector is to retain and create employment in medium to long term. The difficulty experienced by job champions and large companies when attempting to access skills demonstrates that a lack of skilled labour currently inhibits the employment creating abilities of the sector.

Responsibility: the Merseta, companies in the sector

6.2.2 Strengthen the management skills within the sector

Increasingly companies are incorporating their manufactured products within an overall service offering and are beginning to export.

Furthermore, the strategy proposed in the overarching strategy advocates the ongoing provision of data and analysis on both import penetration threats and export opportunities. Being able to translate this information into operational responses is highly dependent on the managerial capacity within companies. Accordingly we propose that the Merseta, together with the sector stakeholders focus on developing short management courses to build management capacity in companies.

Responsibility: the Merseta, companies in the sector, industry associations

6.3 Manufacturing process

6.3.1 Stimulate product and process innovation

The overarching section contains a number of recommendations relating to product and process innovation. Most of those recommendations are applicable to this sector and we believe that the sector would in all likelihood benefit strongly from the implementation of the 'kaizen blitz' workshop recommendations to enhance this 'home-grown' advantage of developing process innovations. It is preferable to focus more on product innovation, as this has a greater potential to create jobs, whereas process innovation is more likely to result in job shedding.

In addition, many of the companies interviewed for this report had started out manufacturing products under license from international partners. This strategy had both enabled the development of:

- Competencies in the manufacture of the product concerned
- The ability to explore and implement innovations that made the product more appropriate for South African conditions, thus laying the foundations for companies to develop experience in innovation.

Accordingly we recommend that TISA encourage manufacture under license to introduce new designs, skills and processes into the domestic sector. In particular TISA should seek to encourage partnerships with companies that develop technologies that are appropriate for the developing world; relatively low-volume, design-intensive and which may require modification to suit different operating environments, as it is in this areas that the sector enjoys existing advantages.

This intervention should be seen as a short to medium term measure to facilitate the transfer of technical knowledge and skills and encourage high quality standards within the industry, which was shown to be important in order to compete successfully, both domestically and in export markets. However, it is acknowledged that such a measure is a double-edged sword in that if sufficient technology transfer does not occur, the domestic sector will develop a long term dependency on foreign design skills and thus it is crucial that manufacture under license is carefully managed to ensure technology transfer. It is also important to note that price competitiveness and efficiency among domestic players would be important factors in securing such license agreements, reinforcing the need for intervention aimed at improving competitiveness.

Responsibility: TISA, NPI, Universities

6.3.2 Support for transition strategies for companies at risk

As discussed above, the balance of trade has steadily worsened since with even the electrical machinery and components sector entering a phase of decline since 1999. This, coupled to the aggregate employment losses over the past 3 years suggests that it is extremely likely that there are companies at risk of increased employment loss over the next 3 years. We propose that the Department of Trade and Industry implement the Global Economic Strategy System and, in particular, the early warning system component of GESS. This will enable the dti to identify product categories in which import penetration is growing rapidly and accordingly areas where companies are potentially at risk. We suggest that the dti:

- Forward such information to the relevant industry associations;
- Request the industry associations to identify companies that are producing such products; and
- Convene twice yearly workshops for these companies to:
 - Inform them of countries where demand for these products are growing, thus hopefully providing them with the opportunity to build alternative revenue streams;
 - Explore what strategies could be implemented to provide temporary relief, including the raising of tariffs;
 - Gain companies' assessments as to whether they believe that dumping is occurring; and
 - Inform them of products in which South African electronics and electrical engineering companies are either growing domestic or global market share.

We believe that such a strategy would provide companies at risk with the opportunity to seek remedial action in the short and the medium-to-long term and be provided with some preliminary assistance in restructuring their companies to take advantage of other. This low-cost approach would also serve to strengthen the dti's contact with companies that are at risk of losing employment thereby laying the foundations for an ongoing assessment of changes in the structure of South Africa's manufacturing economy.

Responsibility: dti, industry associations

6.3.3 Development of a professional outsourcing sector

In some of the qualitative interviews, companies indicated that on occasion they had not pursued new market opportunities as they had not wished to take the risk of permanently employing people in case they were unable to build the opportunity into a sustainable business and then had to incur the administrative and financial costs of undertaking retrenchments. However, they were simultaneously reluctant to use sub-contractors as they did not have the required skill levels to be able to undertake the work required. Accordingly it would seem that there may be demand for organisations that are able to provide skilled production workers for the electronics and electrical engineering sector. This would provide employees with potential access to the labour market and provide companies with a relatively low-risk option to explore new markets.

We propose that the Merseta together with trade unions and appropriate industry associations institute a mechanism to inform all labour brokers of the initiative to select three broking companies to undergo intensive, specialised training and allow brokers to apply for the initiative. This approach will ensure buy in on the part of the labour brokers that undergo the specialised training. Three appropriate labour brokers that are currently registered with SEIFSA would then undergo special skills development projects focusing on the production skills required by the electrical and electronic engineering sector. As the implementation of these programmes will increase both workers' skills and also labour brokers' opportunity to earn, the identified labour brokers should enter a performance contract with appropriate stakeholders where they designate the contribution that the labour broker will make to the sector in return for this increased business opportunity.

Responsibility: the Merseta, trade unions, industry associations

6.4 Demand

6.4.1 Proactively manage and stimulate domestic demand

A joint campaign between the Association of Electric Cable Manufacturers and Proudly South Africa has been extremely successful in ensuring that large projects such as the Airports Company of South Africa give preference to local content and has also created spin-off opportunities for cable producers with other large cable consumers such as Telkom and Eskom, alerting them about the importance of giving preference to local content. This campaign serves as an example for the rest of the sector to follow and illustrates the importance of co-operation between industry associations and the Proudly South African campaign.

Other areas in which domestic demand could be boosted are in large-scale housing projects where the contractors are often awarded contracts to build the housing and the supply of electrical components such as circuit boards, circuit-breakers, wiring, switches and plug points are often done at their discretion. The Department of Housing together with other appropriate government departments should insist that contractors source all electrical cabling, wiring and components from domestic manufacturers. This could be facilitated by creating a list of vendors together with industry associations and trade unions, such a list could be updated on a twice yearly basis to ensure that new entrants to the sector are not excluded. The assembly of some electrical components associated with housing projects is relatively low skill and labour intensive. In certain instances, given sufficient capacity, housing developers could explore providing local communities with the sub-assemblies and encouraging the final assembly of the products on-site. While not being the basis of longer-term industrial growth it may supply temporary employment in depressed economic areas.

Responsibility: Government, industry associations, trade unions

6.4.2 Consider introducing SABS compliance requirements for certain imported products

Many imported products are reported to be of inferior quality and do not meet SABS requirements. There is currently decision making in government regarding quality and the role of the SABS. These discussions should be broadened to include imported products. Procedures for the compliance with SABS standards can be allied to the implementation of the early warning system component of GESS. In instances where import penetration is growing rapidly, the dti should assess whether or not such products have SABS approval and, if not, should suspend import licenses awarded on such products until such stage as the products are SABS accredited. Such a process would both serve to grant temporary relief to domestic manufacturers but also serve to ensure that South African customers do not purchase inferior products unwittingly and that imported products compete on a level playing field with South African products.

Responsibility: SABS, dti

6.4.3 Grow exports

TISA's existing project with the Electro-technical Export Council that has identified product areas in which SA companies may be able to grow exports is a critical intervention and should be appropriately implemented. In particular we recommend that TISA identify a particular 'high yield' set of opportunities identified in the project and implement a comprehensive strategy around those opportunities. These steps could include:

- Identifying companies producing products in which the study revealed potential advantages:
- Holding workshops with the companies concerned to:
 - Inform them of the results of the study;
 - Provide them with advice on accessing these markets; and
 - Assist them in applying for assistance from EMIA to proactively pursue these market opportunities.
 - Implementing the 'kaizen blitz' recommendation in these companies to assist in the improvement of process efficiencies.

Adopting this approach with a clearly defined set of companies would give TISA the opportunity to develop a case study of transforming market intelligence into actual export growth, the lessons of which they could then roll-out across the metals and engineering industries.

Accessing developed markets is difficult for companies in these sectors because of the complexities surrounding standards in developed markets and the development of relationships with international firms has been an important variable in determining success in international markets outside of Africa. Accordingly we suggest that the recommendations made in the overall strategy pertaining to the facilitation of strategic partnerships and FDI would be an important element in developing the export capability of the sector.

Responsibility: dti/TISA

6.5 Operating environment

6.5.1 Protect and grow 'centres of excellence'

The overall strategy notes the importance of growing 'centres of excellence' and recommends that the existing body of innovation, technology and export awards be used to identify such companies. Such a strategy would be applicable in this sector and would undoubtedly add significant impetus to the sector's potential given the high number of award winning companies that are already in the sector.

Responsibility: dti/TISA

6.5.2 Encourage collaboration with the formation of vertical and horizontal partnerships

Perhaps the most important horizontal relationship that the electronics and electrical equipment sector could forge is with the TISA-run Project South Africa that focuses on the delivery of large-scale turnkey infrastructure projects around the world. The expansion of this project to include the electrical and electronic sector could leverage off the sector's capacity to provide flexible solutions to customer's product needs. Over the medium-term; the inclusion of the sector in such projects may serve as a basis for developing a global reputation in the supply of low-volume, customised electrical and electronic goods which would in turn underpin sustained export growth.

This TISA-run export project currently benefits domestic structural steel companies, bidding on large projects but lacks the backward linkages that would see these companies sourcing the necessary components for these projects from the local electronics and electrical sector. This would have potentially important benefits for the electrical machinery industry in particular.

Responsibility: TISA, industry associations, trade unions

6.5.3 Manage the transformation of the labour market and address impediments to employment creation

The overarching chapter of this report makes reference to a number of strategies to increase the pace of transformation in the labour market of the metals and engineering industry. We believe that in addition to these generic strategies, the South African government could use its international leverage to further the objectives of transformation. Some examples of how this could be done include:

- Several senior executives of international ICT and electronics companies sit on the President's Advisory Council. It seems probable that if the President were to prevail upon these companies to give black and female engineering graduates year-long internships in an international division that they would agree to do so; and
- In instances where government department and parastatals have sourced supplies from the South African based distribution arm of an international manufacturer, they make the awards of the tender contingent on the tenderer providing year-long internships for black and female graduates in an international manufacturing division of the company.

The effect of these proposals would be both to give previously disadvantaged individuals experience as well as to provide an injection of foreign experience and exposure into the sector.

Responsibility: Department of Labour, MEIBC

6.6 Conclusion

The electronics and electrical engineering sector is well positioned for employment growth. Furthermore the relatively unique nature of the sector – design intensive, innovative in product and process – and its status as an input into other manufacturing and service sectors means that improvements in the functioning and performance of the sector may well have positive benefits for the rest of the country. While not an immediate priority from an employment creation perspective of the overall metals and engineering industry, much can be done to implement its employment creating potential without considerable extra investment from the state. However, it must be cautioned that there are some warning signs that the sector may be headed for a downturn. Every effort should be made to monitor the sector closely and to implement safeguard measures as soon as it appears that the sector may be under threat, as if the sector were to sustain permanent damage and companies were to disappear, there would be a long-term demise in South Africa's employment creation prospects.