NCVER
National Centre for Vocational Education Research

neca
National Electrical and Communications Association

Australian Government
Department of Education, Science and Training
National Skills Shortages Strategy

Training and skills in the electrical and communications industry

Kirsty Woyzbun
John Saunders
Alison Anlezark
Phil Loveder
Mark Cully
National Centre for Vocational Education Research

Wendy Perry
Wendy Perry & Associates

research

Informing **policy** and **practice** in Australia's **training system**

NCVER

neca

Training and skills in the electrical and communications industry

Kirsty Woyzbun
John Saunders
Alison Anlezark
Phil Loveder
Mark Cully
National Centre for Vocational Education Research
Wendy Perry
Wendy Perry & Associates

Australian Government
Department of Education, Science and Training
National Skills Shortages Strategy

Acknowledgement

The National Centre for Vocational Education Research acknowledges and thanks all those who were interviewed as part of this project.

This material was produced with the assistance of the Commonwealth Department of Education, Science and Training under the Electrotechnology and Data Communications – Licensing, the Ageing Workforce and Industry Information Dissemination: Analysis of Issues and Development of Solutions Project.

This publication was funded by the Australian Government Department of Education, Science and Training.

The views expressed here are those of the authors and do not necessarily represent the views of the Australian Government Department of Education, Science and Training.

ISBN 1 921169 46 X print edition
ISBN 1 921169 52 4 web edition

Revised version

TD/TNC 86.04

NCVER
ABN 87 007 967 311

Level 11, 33 King William Street, Adelaide SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

ph +61 8 8230 8400
fax +61 8 8212 3436
email ncver@ncver.edu.au
<http://www.ncver.edu.au>

Foreword

This research provides a detailed analysis of the electrical and communications industry workforce, the depth and scope of which has not been previously available.

It provides a comprehensive profile of the electrotechnology workforce, identifying how it adapts to the dynamics of the industry and how well it is positioned for the future.

The findings provide a valuable tool for assisting the industry, governments and authorities in the development of policy and in planning to ensure the electrotechnology sector is able to attract and retain a skilled and committed workforce for the future, one that is able to meet the changing needs of industry, customers and technology.

It is also valuable for those employers in the industry wishing to develop business plans, manage future growth and take advantage of new market opportunities.

The research was undertaken as part of the Australian Government's National Industry Skills Shortage Strategy Project: 'Electrotechnology and Data Communications – Licensing, the Ageing Workforce and Industry Information Dissemination: Analysis of Issues and Development of Solutions'.

It has provided a platform for the recommendations outlined in the project report.

I commend this research to you.

Neville Palmer
President
National Electrical and Communications Association

Contents

Tables and figures

Tables

Figures

Key messages

This study set out to profile the electrotechnology industry workforce, and to understand how the industry is adapting to the rapidly changing environment, and how well it is positioned for the future. Through an analysis of extant data, combined with 25 in-depth interviews with contractors, training providers and vendors, this study provides the following key messages.

- The electrotechnology industry has adapted well to the growing demands from its customers to integrate the electrical and communications skills sets into a narrow range of occupations, such as electrical and communications tradespersons. The industry response has been to use the traditional electrical tradespersons as the core of its skill base, up-skilling in new technologies and the communications area predominantly by vendor training and short courses.
- Training within the formal Australian Qualifications Framework (AQF) structure in emerging technologies within the electrotechnology industry has been reactive rather than future-looking, with vendor training filling the gaps by providing the workforce with the skills required for new products as they are brought to market.
- Since mid-2004 there has been a flattening of the steady increase in skills shortages experienced over the preceding three years. Other evidence indicates that the skills shortages remaining in the industry tend to be region- or occupation-specific. The challenge appears not to lie in attracting people to the industry across the board, but rather, in attracting those with the appropriate skills or the ability to gain the appropriate skills, and to do so in the geographic regions of high need.
- One vulnerable group of employees in the electrotechnology industry may be non-tradespeople who have only specialist skills in the data communications area. This group of employees tends to have lower-level (certificate II) qualifications, and the industry tends not to train them up to the electrical trades certificate III level, but rather the other way around—training electricians in the data communications area. With predictions of a downturn in the information communications and technology (ICT) area in the future, this creates a vulnerable workforce group.

Summary of findings

Rapid changes in technology and the development of the information communications and technology (ICT) sector over the past two decades have created significant challenges for the electrotechnology industry. Technological developments in electrical equipment and changes in regulatory requirements are creating a need for a more highly skilled electrotechnology workforce across a broader range of applications of the technology.

To assist the National Electrical and Communications Association (NECA) in its representation of electrical and communications contractors, this study set out to profile the electrotechnology industry workforce[1], and to understand how the industry is adapting to the rapidly changing environment and how well it is positioned for the future. Through an analysis of extant data, combined with 25 in-depth interviews with contractors, training providers and vendors, the study set out to answer two pertinent questions.

- What 'learning' did the industry and its workforce go through to enable it to deal with growing demands from its customers to integrate the electrical and communication components of a job?
- How well equipped is the industry and its workforce for the future, and what further 'learning' is needed—for instance, in the kind of training provided to enable the industry to continue to meet the demands of its customers?

This report is in three sections. The first provides a summary of the key findings and some context. The second section contains the findings of the statistical analysis, and the third, the interviews with contractors, vendors and training providers. A series of appendices provides tables of data from which the report statistics were derived, together with questions and materials used in interviews.

The findings expand the two broad questions above into key areas covering the electrotechnology workforce profile, tenure, current and future training activity, and an exploration of how the industry is coping with rapidly changing technology. The key findings of the research are:

The workforce is young and almost exclusively male

- In 2001, it is estimated through an industry-occupation lens[2], that NECA members employed around 153,400 people, of whom 59,400 (38.7%) were in jobs making use of the core skills of the industry, that is, the electrical trades (hereinafter referred to as the *electrotechnology specialist workforce*). When compared with all industries, this represents a workforce utilising significantly more specialist skills.
- The specialist electrotechnology specialist workforce is almost exclusively male and predominantly employed in the installation and trade services area (80.3%), and most (95.6%) are employed as electricians. It is a comparatively young workforce, with almost half aged less

[1] As noted in the 2004 Industry Skills Report (April 2005) prepared for the ElectroComms and EnergyUtilities Industry Skills Council, the electrotechnology group does not coincide precisely with any of the Australian Bureau of Statistics (ABS) industries defined under the standard industry classification (ANZSIC).

[2] One of the key challenges for this project was in scoping the electrotechnology industry. There are several classifications where electrotechnology skills predominate, but skilled electrotechnology workers are distributed across almost all industries. For the purposes of this report, the National Centre for Vocational Education Research (NCVER) developed an industry profile using a correlation of industry and occupation classifications detailed in the appendices.

than 35 years, reflecting a high proportion of apprentices in the industry and high attrition rates for those over 35 years.

A high degree of industry retention, but a high level of inter-firm mobility

- ✧ Despite the relatively young age profile, half of the specialist electrotechnology workforce has been working in the industry for ten years or more. However, these specialist employees do not stay with one firm, with over half (58.7%) of them working for the same employer for less than five years. This high degree of mobility in the industry, together with the longer tenure in the industry (as opposed to tenure with the employer) suggests that the industry is well organised with respect to skills replenishment, with a healthy level of inter-firm movement and a highly competitive specialised workforce. However, for some companies, this inter-firm movement can reduce the return on investment from training when employees move on soon after completing apprenticeships or more specialised training.

Skills shortages are becoming regional or occupation-specific

- ✧ Turning to skills supply and demand, the Skilled Vacancy Index (SVI), an indicator of skills shortage, rose steadily for the electrical trades between 2001 and mid-2004, since which time it has flattened. This may indicate that there has been a lessening in skills shortages in recent times. Other Department of Employment and Workplace Relations (DEWR) evidence suggests that skills shortages remain in the electrotechnology industry, but these are regional or occupation-specific and cannot be generalised to the whole electrotechnology industry.
- ✧ In the qualitative interviews, there was supporting evidence for a slowing-down of the skills shortages, with about a quarter of contractors interviewed not identifying any skills shortages or stating that current skills shortages were only expected to be an issue in the short-term. Reasons given were that the skills shortages were linked to the local building and construction industry in which demand was expected to slow. Those interviewed also noted that skills shortages were a local rather than a national issue, and that geographic location and local economic factors also played a part in determining them.
- ✧ Reflective of the flattening of the SVI, employment levels in the electrical trades peaked in 2003 and have since abated. Exits from the industry—retirements or changes to other occupations—mean that there has been, and is forecast to be, a steady level of replacement demand.

Apprenticeships continue to be the entry point into the industry

- ✧ Demand for more employees in the electrotechnology industry continues to be met through apprenticeships, which remain the predominant entry point into the industry, and through some electrical tradespersons moving into the more specialised electrical areas of the electrotechnology industry. There continues to be little entry-level training for the electrical segment of the industry outside the traditional apprenticeships.
- ✧ At current training rates, we would expect there to be around 2,000 electrotechnology and telecommunications apprenticeship completions in 2005, with the supply expected to be at around this level or higher in subsequent years.[3] It is expected that these apprentices will continue to be taken up by the industry at the current full rate.

The industry is adapting to the changing technology

- ✧ The industry has adapted, and will continue to adapt to rapidly changing technology. The industry will need to continue to keep pace with new technology, but it may well have the opportunity to be more selective about who it takes on in the next five years as supply grows.

[3] It must be acknowledged that the statistics on apprenticeship numbers are estimated from the contracts of training rather than individuals, and that some will take more/less than four years to complete their training (for example, they may be part-time), or may swap between contracts with individual employers.

As supply is met, there will be less competition for highly skilled electrotechnology positions, and possibly decreased inter-firm mobility.

Current post- or non-apprentice training for existing workers is dominated by short-courses, with some specialised training at certificate IV and above

- Around three-quarters of the specialist electrotechnology workforce have a certificate III or certificate IV qualification. Around 20% have no post-school qualifications—these may be either apprentices in training or people who have acquired the necessary skills to operate in the industry from experience.
- Current training in the industry appears to follow three different training routes:
  - There are the new entrant apprentices undertaking full qualifications predominantly at certificate III level (UTE Training Package) for electrotechnology and at certificate II level (ICT Training Package) for telecommunications.
  - The second training route is undertaken by some new entrants, but also by existing workers training at higher levels such as certificate IV and beyond in telecommunications. This group tends to be more focused on higher levels of technical expertise and understanding how systems and installations work, rather than on the installation processes.
  - The third training route is where training is in short courses and modules rather than in full qualifications, enabling existing workers to up-skill in line with technology change. This training is mostly short courses, which usually do not lead to a full qualification, but rather, to individual certificates of attendance or competency; for example, Clipsal's integrated systems course, or single modules from the UTE and ICT Training Packages. This training of existing workers is provided by vendors and other private industry providers of training, as well as by technical and further education (TAFE) institutes. It is driven by licensing, new technology, product warranty and industry regulation and compliance.

Vendor training provides specialist product knowledge and must meet market demand

- Vendor training is seen as providing specialised product-related knowledge that is responsive, up-to-date and often compulsory for warranty conditions to be met. Vendors are not seen as competitors to TAFE, but rather as complementary training providers, teaching new skills as they are required rather than a broader set of core skills as provided by the public sector (TAFE). The vendors are often not registered training organisations (RTOs), but may work with an RTO or TAFE, if only to provide a venue, or to check off competencies for accreditation. Vendors are perceived as *being technically cooperative [with each other], but commercially competitive.*

The UTE Training Package provides the core skills training for the industry

- Within the scope of our analysis, training package activity is mostly (96%) in the electrical (UTE Training Package) rather than in the telecommunications (ICT Training Package) or lifts (UTL Training Package) areas. Around a third of all training package activity is undertaken by apprentices or trainees. The Certificate III in Electrotechnology Systems (UTE31199) is the core qualification for apprentices.
- Training packages have had a rapid uptake since their inception in 1999 and, with most having a nominal four-year duration, the industry is now experiencing some stability. In the interviews, contractors indicated that where employees with dual skills in electrical and data-communications were required, the preferred strategy was to recruit electrical workers and then augment their skills with training in data communications rather than the other way around. It was much easier to train an electrician in data communications via short courses than train a data communications employee up to electrical licensing standard.
- Much of the training undertaken by existing workers within the training package is not for full qualifications, but for single units of competency (or modules).

- There were several comments made in the qualitative interviews about the inflexibility of the training packages and their perceived inability to keep pace with rapidly changing technology. Further, while training packages contain the relevant competencies, where they exist in different training packages, there is currently no way of integrating qualifications from different training packages into a single nationally recognised qualification.

Public and private providers have different training markets

- In terms of private versus publicly funded training for the electrotechnology industry, it would appear that, of the three training routes described previously, the public provider (TAFE) provides the bulk of the base-level core skills set, and some of the higher-level qualifications such as the certificate IV and beyond for specialist technicians. Training for new products as they come to market is the domain of the vendors and some private training providers who are seen as more flexible and responsive than public providers (TAFE). However, there were some examples provided in the qualitative interviews of TAFE working with the vendors, for example, in providing a training room, or the vendor providing products for the courses, but this was not widespread. There is clearly a difference between the ability of public versus private providers to respond quickly to new training requirements.

The electrotechnology industry is highly responsive to rapidly changing technology

- The electrotechnology industry has had to adapt to technological developments in electrical equipment, changes in regulatory requirements, and the increasing onus on contractors and their employees to accept responsibility for work performed. The industry has responded by broadening the skills base of the traditionally blue collar field of electricians with the skills of the traditionally white collar area of information communications and technology, but not the other way around, because of licensing and regulation issues. This integration of occupations has resulted in a specialised skilled workforce of around 60,000 employees.
- Technological change has driven training to a point where the electrotechnology industry has a well-trained workforce capable of planning, installing, configuring and troubleshooting installations. The industry is also using new technology to its advantage with, for example, the use of electronic devices (PDAs [personal digital assistants], laptops, mobile technology etc.) in the field.

Changing technology has meant that training has found niche markets, TAFE providing core skills and vendors providing specialised training for new products as they come to the market

- The industry is demanding training in new technology that is appearing in systems and products. This is outstripping the ability of traditional training providers to develop and incorporate it into their curriculum, resulting in vendors providing the necessary training to ensure that their products are supported in the market with tradespersons with the necessary skills to install and service these products.

Changing technology has meant that contractors, many of whom are smaller concerns, have to take time out to undertake vendor training for warranties to be valid

- Contractors are often small businesses, or business owner-operated, and can ill afford extensive time out for training in new products. Short courses are their preferred training option.
- Contractors sometimes have reservations about vendor training in terms of its purpose, some seeing it focused on promotion of a product rather than on delivery of training. However, contractors, generally, are satisfied that this is currently the best way of obtaining training in the new technology.

- Vendors point out that the training is essential to the users of their products, and for this reason promote warranty arrangements that are conditional upon, for example, a proportion of installers and service personnel having undertaken the new product training delivered by the vendors.

Electrical contractors are either training their existing workforce, employing those with data communications and electrical skills or sub-contracting out the data communications elements of their work

- Electrical contactors are increasingly faced with the need to integrate data communications work into what used to be predominantly electrical tasks. This has meant that they must either contract-out data communications elements of the work, or employ workers with the knowledge and skills to handle that aspect of the work.
- Qualitatively, it appears that for those contractors who elect to undertake the data communications work themselves, the most common solution is to train their existing electricians in the essential data communications skills to do the work (or alternatively to recruit such an electrician). Larger companies may employ a few data communications specialists, but this is not possible in smaller companies. For contractors generally, the preference appears to be to train electricians in the data communications rather than employ data communications specialists. This creates a more highly specialised workforce. Nevertheless, some larger companies are retaining electricians with less specialisation and more detailed electrical knowledge to complement their more technically specialised counterparts.

The project: Background, objectives and approach

Background

Rapid changes in information technology and the development of the information communications technology (ICT) sector over the past two decades have broadened the skills base of those who work in the industry, as well as opening up new skills areas and attracting new entrants to the electrotechnology industry.

Increasingly, the industry has had to adapt to growing demands from its customers to integrate the electrical and communications components of a job. This has resulted in a blurring between the two, and a decrease in the number of contractors who can afford to restrict their work to just one of these areas. It has been a challenging period for the industry, and there is every likelihood that the future will be, at the very least, equally challenging.

About the electrical and communications industry

The peak body for the industry is the National Electrical and Communications Association (NECA), which represents around 5,000 businesses across Australia. NECA is an active participant in the bodies which play a role in determining technical standards and codes, licensing arrangements and training—all of which, in turn, have a bearing on who is employed in the industry, and the skills, qualifications and experience they bring to their work.

The industry is made up of contractors, ranging in size from very large companies to sole traders. The work is applied in industrial, commercial and residential settings, with many businesses operating across all spheres. Houghton and Morris (2003) estimated that contractors within the industry contributed $4.8 billion per annum to the Australian economy in 2000, from the approximately $50 billion annual turnover generated by the electrotechnology industry. A further $2.5 billion is attributed to the contracting sector of voice and data communications.[4]

Related electrotechnology industry research

There are several existing and current research projects being undertaken relevant to this project. The National Centre for Vocational Education Research (NCVER) has undertaken a study on employer engagement with New Apprenticeships in the electrotechnology industry (NCVER 2002), identifying key drivers for their uptake as firm size and availability of work, suggesting that the industry may need to look further than teenagers in hiring apprentices; in 2000 NCVER undertook research into skill shortages in the electrotechnology industry for the Electrotechnology Working Group (NCVER 2000).

Other recent research includes the ElectroComms and Energy Utilities Industry Skills Council report (ANTA 2005) published by the Australian National Training Authority (ANTA; now superseded by the Department of Education, Science and Training [DEST]). This report profiles the industry and

4 Sourced from National Electrical and Communications Association website (October 2004), viewed September 2005, <www.neca.asn.au>.

identifies factors impacting on skills needs for the sector. However, while relevant to this study, the Industry Skills Council report is much broader in scope than the electrotechnology industry.[5]

Another relevant piece of research is the work being undertaken by Waterhouse, Virgona and Brown (in press), which used a case study of Motorola working with local government and schools to address skills shortages in Casey, Victoria. This research demonstrated that partnerships with the electrotechnology industry can work to stimulate interest in the industry for longer-term benefits. However, to maintain a successful partnership, there must be clear understanding and brokering of the different perspectives and priorities held by different parties. Industry is looking for speedy decisions and clear outcomes, which can be quite different from teachers' priorities on teaching styles and processes.

So while existing research has looked at aspects of the industry (apprenticeship uptake and partnerships) and more general industry skills requirements of the sector of which the electrotechnology industry is part, there has been no specific research relevant to the skills requirements of the electrotechnology industry. Further, since the writing of the previous NCVER report (NCVER 2002), there have been rapid developments in technology (think of the home theatre market or the increasing range of remote controlled appliances in a household), which have had a significant impact on the skills requirements of those working in the industry.

Research questions

This study set out to provide NECA with information to assist it in planning for future skills needs in a dynamically changing industry. Specifically, the research set out to address the following research questions:

1 How many people are currently employed in the electrical and communications industry, and what is their age and tenure profile?

2 What are the skills, qualifications and experience of those employed in the industry?

3 What training is currently being undertaken in the areas of electrical and communications work?

4 How much of that training is being provided by the publicly funded vocational education and training (VET) system?

5 How much training is occurring through non-publicly funded providers?

6 How much of the training provided makes use of the relevant industry training packages:
   a Electrotechnology Industry (UTE) provided by the publicly funded vocational education and training system?
   b Telecommunications (ICT)
   c Lifts Industry (UTL)

7 What is the balance between entry-level training and further training?

8 How is the industry coping with new and emerging occupations and new technology:
   a what impacts are changes in technology having on contractors, training providers and vendors in terms of industry skill needs and training?

[5] It was reported in the ElectroComms & EnergyUtilities Industry Skills report (ANTA 2005) that 'the National Electrical and Communications Association (neca) had a view that the report did not appropriately segregate or reflect the activities of the electrotechnology sector.

b what changes in occupations and skill sets are needed to accommodate the technological changes impacting on contractors?

c how are contractors currently coping with any workforce deficiencies brought about by technological change?

d What are the impacts of technological change on the industry?

Approach

NCVER undertook a two-stage approach to answering these questions.

The first stage utilised extant data obtained from the Australian Bureau of Statistics (ABS) and NCVER collections. ABS sources included the 2001 Census of Population and Housing, the 2001 Survey of Education, Training and Information Technology and the yearly Labour Force Survey. NCVER sources included the national VET provider database, apprenticeship collection and the 2005 Student Outcomes Survey. Other data used included the Department of Workplace Relations 2005 Skilled Vacancies Index.

The second stage comprised a series of interviews with 21 electrotechnology contractors. A few of these interviews were conducted face to face, the remainder were conducted by telephone. In-depth telephone and face-to-face interviews were also conducted with two major training providers and two high-profile vendors who engaged in training.

As much as possible, the focus of both stages of the project has been on companies and employees working in electrotechnology and data communications (as opposed to working in electricity generation and electricity transmission and distribution), and more specifically, on contractors involved in installation, maintenance and repair of electrical and electronic equipment. Table 1 summarises the approach.

Table 1: Summary of approach

Topic	Approach	
	Qualitative	Quantitative
How many people are currently employed in the electrical and communications industry, and what is their age and tenure profile?		✓
What are the skills, qualifications and experience of those employed in the industry?		✓
What training is currently being undertaken in the areas of electrical and communications work?		✓
How much of that training is being provided by the publicly funded vocational education and training system?	✓	✓
How much training is occurring through non-publicly funded providers?	✓	✓
How much of the training provided makes use of the relevant industry training packages: Electrotechnology Industry (UTE), Telecommunications (ICT)		✓
What is the balance between entry-level training and re-training?	✓	✓
How is the industry coping with new and emerging occupations and new technology?	✓	
What are the impacts of technological change on the industry?	✓	

The next two sections describe the findings of each of these approaches, with supporting evidence contained in the appendices.

Statistical analysis

The first phase of the project involved an analysis of employment levels and growth, job vacancies, skill needs, tenure, and education and training in the electrical and communications industry.[6] This included consulting previous research into skills shortages, and obtaining data from various Australian Bureau of Statistics sources, including the 2001 Census of Population and Housing, the 2001 Survey of Education, Training and Information Technology and the yearly Labour Force Survey. Other data used included the Department of Employment and Workplace Relations (DEWR) 2005 Skilled Vacancies Index.

NCVER sources used included the National VET provider database, Apprenticeship collections, and the 2004 Student Outcomes Survey (SOS). By using a range of both current and historical education and training data, including the full array of NCVER data on students and courses in public VET and on apprentices and trainees, training activity could be described in detail.

The statistical analysis phase of the project was expanded further by obtaining quantitative information on other sources of training from selected vendors and private RTOs within the electrical and communications industry. By examining trends in post-trade training and the supply of skills beyond traditional apprenticeships, the report seeks to examine how contractors are supplementing their existing core skill sets and what opportunities for skill development are made available to the industry workforce. These data were used to broaden the frame of reference relating to how the electrical and communications industry responds to the demands of technological change and the rise of new occupations, outside the use of public VET courses.

Finally, literature relevant to the electrotechnology industry—and Australian industry generally—was used where it aided the understanding of the issues being explored.

Methodology

NCVER undertook an analysis of extant data obtained from NCVER collections (including New Apprenticeships and VET databases) to investigate and report upon training by:

- employer characteristics, such as type of employer (e.g. group training organisation, private enterprise, government), employer size and whether training was provided to new entrants or existing workers
- course characteristics, including use of training packages and qualification levels
- student enrolment and attainment, including demographic characteristics, such as age, previous education and geographic area profiles

[6] *Editorial note:* in the statistical analysis of the industry workforce, the terms 'electrical and communications', 'electrotechnology' and 'electro-communications industry' are used more or less interchangeably, although in each case, this refers to the core population of approximately 59,400 workers identified in Table 4 (those with specialist skills employed in NECA-associated industries). To avoid confusion, in the analysis of training provision (see 'Supply of skills to the electrical and communications industry'), the use of the term 'electrotechnology' is used primarily in relation to the UTE99 Electrotechnology Training Package offered under the public VET system.

- training arrangements, such as whether or not training was undertaken as part of work-based training or school-based New Apprenticeships.

A comparative approach was used in the project, with apprenticeship and traineeship activity (commencements, completions and in-training data) compared with that of other VET enrolments in Electrical and Communications Training Packages. By contrasting age and previous education profiles between apprenticeships and non-apprentice training activity, this report seeks to examine industry engagement with accredited training and highlight any differences in student age, career stages and employment characteristics between the two training pathways.

Other NCVER sources consulted, including the Student Outcomes Survey, were used to examine:

- student satisfaction with training
- student destinations and employment outcomes
- rates of further education.

Data scope

Information on the employment and retention of workers within the electrical and communications industry was sourced primarily from Census data and other surveys conducted by the ABS. The Stage 1 research made use of these data sources to provide a short overview of labour demand across the industry. Wherever possible, sub-industry and occupational breakdowns are provided.

A profile of the electrical and communications industry workforce was developed using a correlation of industry and occupation classifications, using standard ABS nomenclature. As a background to this analysis, NECA identified the following broad areas of operation among its membership organisations:

- commercial
- voice and data communications
- residential
- electricity supply sector/high voltage
- fire detection
- hazardous location
- industrial
- manufacturing
- refrigeration, air-conditioning and cooling
- security
- home/building automation.

Through close investigation of each area of operation, these were found to correspond to selected industry sub-classifications using Australian and New Zealand Standard Industrial Classification (ANZSIC) codes (ABS 1993), in each case falling under the Manufacturing and Construction divisions (see Table 2).

Table 2: Industries included in data scope for electrical and communications industry, Australian and New Zealand Standard Industrial Classification (ANZSIC: 1993)

ANZSIC code	Industry descriptor
2842	Telecommunication, Broadcasting and Transceiving Equipment Manufacturing
2849	Electronic Equipment Manufacturing nec
2852	Electric Cable and Wire Manufacturing
2859	Electrical and Equipment Manufacturing nec
2865	Lifting and Material Handling Equipment Manufacturing
4112	Residential Building Construction nec
4113	Non-Residential Building Construction
4122	Non-Building Construction nec
4232	Electrical Services
4233	Air Conditioning and Heating Services
4234	Fire and Security System Services

Note: nec = nowhere else classified.
Source: ABS (1993)

The classification relating to the lifts industry (including elevator installation, elevator or elevator parts manufacturing, escalator installation and escalators or escalator parts manufacturing) was included in response to information obtained during the qualitative phase of the project.

Industry classifications pertaining to electricity supply have not been included in the list of relevant industries, as electrical services to the electricity generation industry (including the construction, installation, repair and maintenance of equipment) are captured under the Non-Building Construction classification, and are already included in the data scope.

In order to capture the electrical and communications workforce as accurately as possible, industry classifications were cross-tabulated with a series of nine occupational categories using the Australian Standard Classification of Occupations (ASCO2) (ABS 1997) (see Table 3).

Table 3: Occupations included in data scope for electrical and communications industry, Australian Standard Classification of Occupations (ASCO2)

ASCO code	Occupation descriptor
3123	Electrical Engineering Associate Professionals
3124	Electronic Engineering Associate Professionals
4311	Electricians
4312	Refrigeration and Airconditioning Mechanics
4313	Electrical Distribution Tradespersons
4314	Electronic Instrument Tradespersons
4315	Electronic and Office Equipment Tradespersons
4316	Communications Tradespersons
9918	Electrical and Telecommunications Trades Assistants

Employment in electrotechnology trades was estimated at an overall 220,000 in 2000 (accounting for approximately 2.4% of total employment in Australia) (NECA 2002), but for the purposes of this report data scope has been limited to the core business of the electrical and communications workforce by focusing analysis on the selected industries and occupations outlined above.

By targeting occupational groups as well as industrial classifications, it was intended to limit the risks of over-inclusion by excluding administrators, managers and supporting staff working in the industry. A list of eight occupations was originally identified in the 2000 NCVER study for the Electro-technology Working Group (NCVER 2000), which has been expanded in this study to

include Electronic Engineering Associate Professionals, to more precisely capture fire and security operations, and voice and data communications sub-sectors within the industry.

From the 2001 Census, this targeted approach yielded a sub-population of approximately 59,400 employed persons within the specified electrical and communications fields.

Table 4: Electrical and communications workforce, 2001

	NECA industries	Other industries
Specialist skills (e.g. electrical trades)	59,400	101,500
Non-specialist skills	94,000	7,902,200
Total	**153,400**	**8,003,700**

Source: ABS Census of Population and Housing, 2001

Limitations of data

This report utilises data on the electrical and communications industry from a number of different sources, primarily taken from various ABS Surveys and DEWR information on vacancy rates. However, there are a number of limitations and inconsistencies with these data sources. For example, information taken from the 2001 Census of Population and Housing and the 2001 Survey of Education, Training and Information Technology, must be regarded as historical data rather than a snapshot of the current state of employment within the industry, given that data from these surveys are over four years old. This project sought to overcome undue replication of previous research using the same sources (e.g. NCVER study for the Electrotechnology Working Group [NCVER 2000] and *Employer engagement with new apprenticeships in the electrotechnology industry* [NCVER 2002]) by targeting a core subpopulation of selected industry and occupational groups within the data and updating labour force information previously supplied. This enabled a stronger degree of precision in identifying demographic and employment trends among industry sub-sectors, as well as comparisons with other industries.

The 2001 Survey of Education, Training and Information Technology was limited in the amount of information able to be used for the project, as only a small number of respondents were identified as belonging to the electrical and communications workforce (a sample size of approximately 139 persons out of a total of 24,377 respondents). Data could not be obtained below the three largest states and no sex breakdown could be supplied at all. No disaggregation between sub-sectors or occupation could be provided, due to the small size of the sample, and no information on employer-provided training could be sourced, due to the large standard errors yielded by data analysis at this sub-population level.

The 2001 Survey of Education, Training and Information Technology and the 2005 Labour Force Survey also use different industrial classification codes (ANZSIC), due to data being available only at the Group, or 3-digit level. (Data sourced from the 2001 Census were available at the Class, or 4-digit level, which enabled greater accuracy in targeting key sub-sectors within the industry workforce.)

Finally, data obtained from the 2005 Skilled Vacancies Index obtained from the Department of Workplace Relations were able to be disaggregated into sub-levels only, including Trades (Electrical and Electronic Trades; and Construction Trades) and Associate Professionals (Building and Engineering).

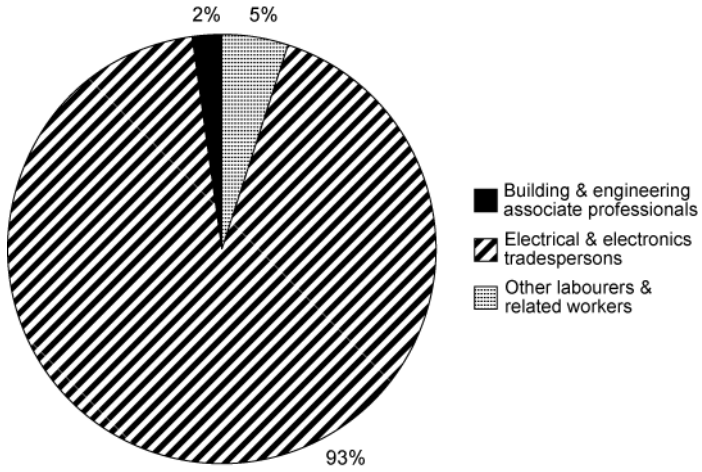
The electrical and communications industry

Skills shortages in Australian industry

The current skills shortage of tradespersons is important for the electrical and communications industry, given that nearly 94% of electrotechnology occupations fall within the skilled trades,

including a workforce of over 44,130 electricians working within identified electrotechnology fields, accounting for some 74.3% of the industry.

Figure 1: Employment in electrical and communications occupational groups, August 2001

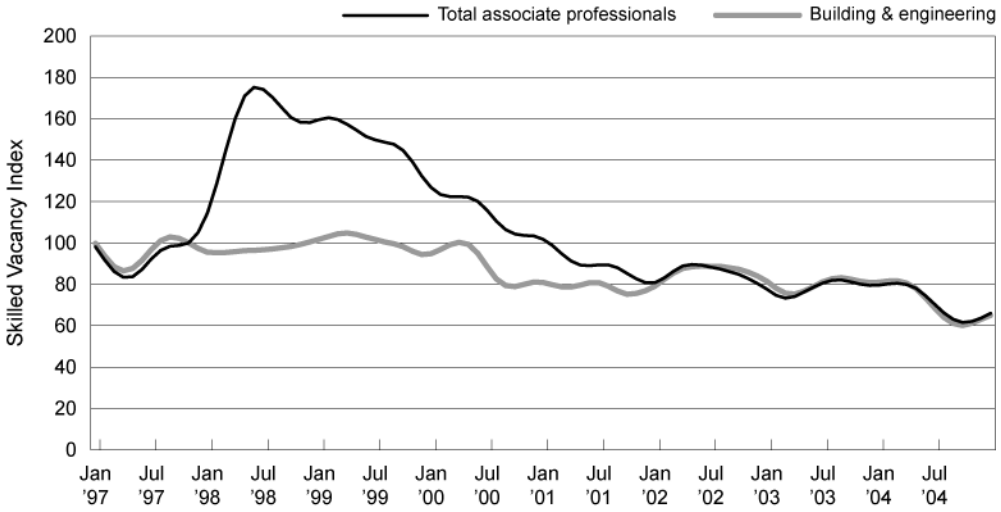


Source: ABS Census of Population and Housing, 2001

Shortages in the associate professions are also important to the industry, with electronic and electrical engineers (approximately 5% of the electrotechnology workforce) classified within this group. (A breakdown within classifications for occupation (ASCO2) and industry (ANZSIC) is shown in Table A3 in Appendix A.)

As illustrated in Figure 2, demand for associate professionals reached a peak in the late 1990s, with a steady decline from 1999. The increased demand for associate professionals in the late 1990s was not uniform across all industries, however, with building and engineering occupations remaining relatively stable during this period.

Figure 2: Skilled vacancies index for total associate professionals, and building and engineering associate professionals, 1997–2005

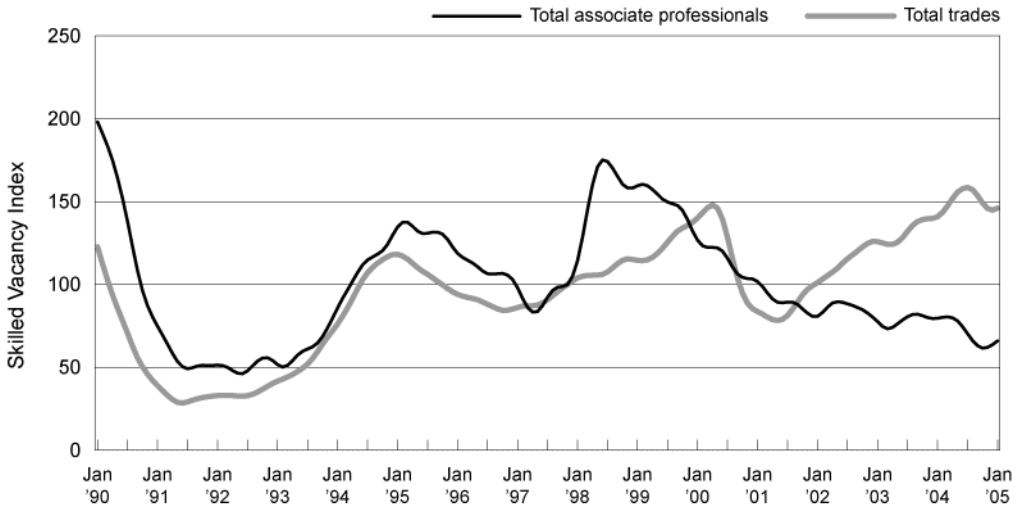


Source: Vacancy report, Department of Employment and Workplace Relations, September 2005

While the demand for trades generally followed a similar pattern to associate professionals during the 1990s, a different trend was established after 1998, with demand dropping in 2001 before increasing again in recent years. The figure below shows that over the last four years, vacancies in

the trades have exceeded those for associate professionals, with the number of skilled vacancies in July 2004 reaching its highest point in over a decade.

Figure 3: Skilled vacancies index for total associate professionals and total trades, 1990–2004



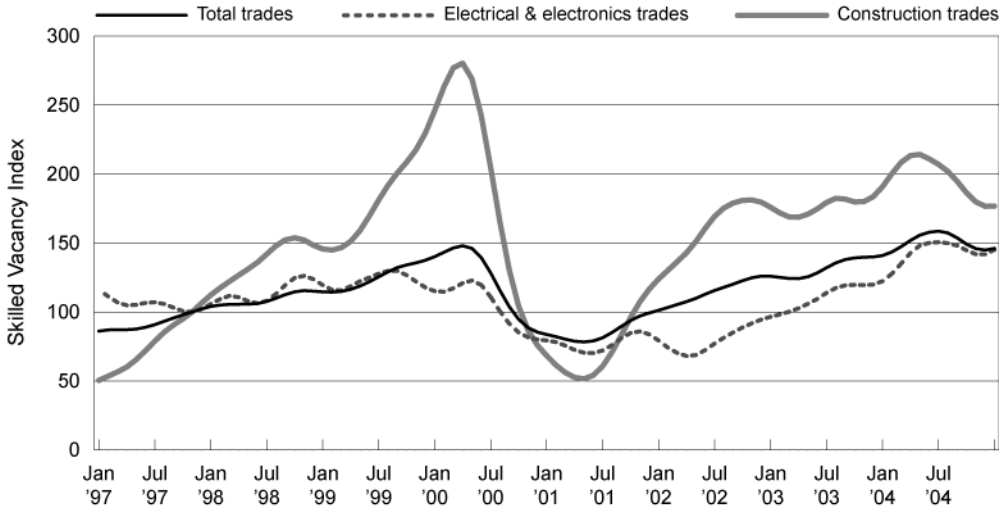
Source: Vacancy report, Department of Employment and Workplace Relations, September 2005

Growth in job vacancies was not consistent across all occupations, however, with moderate vacancy levels for Electricians, but low vacancies for both Electronic Instrument Trades and Communications Trades. Likewise, employment growth and job prospects were below average and expected to fall further in these sub-sectors. By comparison, growth for Electricians to 2009–10 is expected to be moderate, with approximately 6% of new jobs generated by employment growth, rather than from workers leaving or changing occupations within the sector (DEWR 2005).

Skill shortages in electrotechnology

While the demand for building and engineering associate professionals has presented as stable over the past decade, skilled vacancies for construction trades show significantly more movement over this time, with demand peaking in 2000 and falling in the subsequent year, linked to activity in New South Wales for the Olympics. Fluctuations in electrical and electronics trades have not been as marked, with demand coinciding with patterns for other trades.

Figure 4: Skilled vacancies index for total trades, electrical and electronic trades, and construction trades



Source: Vacancy report, Department of Employment and Workplace Relations, September 2005

Demand across states has followed economic rather than population trends, with high demand for labourers, factory and machine workers in South Australia, New South Wales and the Australian Capital Territory.

Table 5: Australian JobSearch vacancies by occupational category, September 2005

Occupational category	AUST	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Building & Construction	2,454	595	916	528	97	238	37	34	9
Electrical & Electronics Trades	1,280	351	499	125	109	139	18	26	13
Labourers, Factory & Machine Workers	13,953	4,040	4,047	2,202	2,032	1,354	104	88	86
Metal & Engineering Trades	3,170	723	1,246	480	267	352	58	37	7
Total select categories	**20,857**	**5,709**	**6,708**	**3,335**	**2,505**	**2,083**	**217**	**185**	**115**
% vacancies in electrotechnology occupations	22.7	19.5	27.1	16.7	35.5	28.0	18.4	14.2	14.2
Total vacancies	**91,890**	**29,329**	**24,754**	**19,995**	**7,063**	**7,452**	**1,179**	**1,307**	**811**

Source: JobSearch vacancy report, Department of Employment and Workplace Relations, September 2005

By contrast, Victoria, Tasmania and the Northern Territory recorded high vacancy rates for skilled tradespersons in building and construction, as well as in metal and engineering trades. Both the Northern Territory and the Australian Capital Territory also reported vacancies in electrical and electronics trades at approximately twice the rate of the national average.

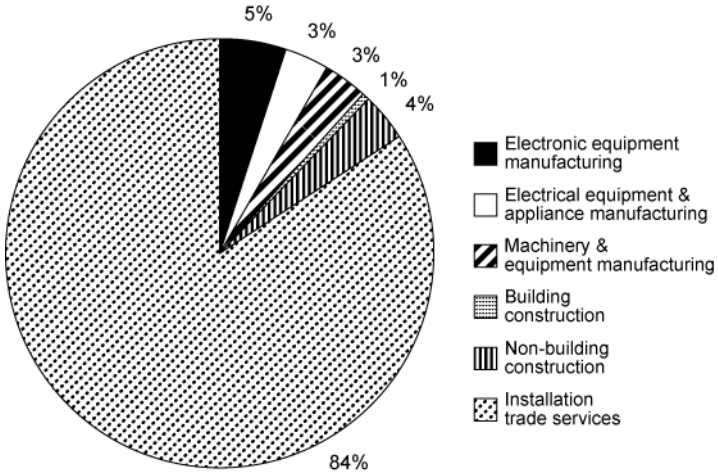
The number of vacancies advertised in Queensland and Western Australia shows as more or less consistent with national trends across all occupational sectors. Other research conducted by the Department of Employment and Workplace Relations, however, reveals skills shortages in electrical appliance servicing and industrial electricians in Queensland, and the need for workers with cabling licences and data/communications experience in Western Australia (DEWR 2005). The 2004 National Skill Shortage (NSS) List for Australia also highlights the shortage of skilled workers in New South Wales experienced in commercial and industrial work, domestic building maintenance, communications cabling and electrical fitting, and electronic instrument trades (DEWR 2005).

Employment in the electrical and communications industry

Employment in electrotechnology is primarily in installation, encompassing 84% of the electrical and communications workforce employed across selected occupations.[7] Manufacturing and construction sub-sectors account for the remaining population, with construction comprising less than five per cent of the overall electrotechnology workforce.

[7] Figures shown for sub-sectors such as Installation Trades Services are shown as an aggregate of the selected industries and occupations identified for this project (see Table A3 in Appendix A). They do not include other industries or occupations listed within that sub-group or class of ANZSIC or ASCO2 classifications, which are out of scope of this analysis.

Figure 5: Employment in electrical and communications sub-sectors, August 2001



Source: ABS Census of Population and Housing, 2001

The greatest coalescence between selected sub-sectors and occupations relevant to the electrotechnology industry is around Electrical and Electronics Tradespersons (including Electricians) working within Installation Trade Services, in which there is crossover workforce of 80.3%, or approximately 47,670 persons from a population of 59,400.

Table 6: Employment in electrical and communications industry, by occupation, August 2001

Industry sub-sector	Building & engineering associate professionals		Electrical & electronics tradespersons		Mining, construction & related labourers		Total	
	Freq.	%	Freq.	%	Freq.	%	**Freq.**	**%**
Electronic Equipment Manufacturing	1,019	1.7	2,060	3.5	36	0.1	**3,115**	**5.2**
Electrical Equipment & Appliance Manufacturing	245	0.4	1,662	2.8	63	0.1	**1,970**	**3.3**
Machinery & Equipment Manufacturing	44	0.1	1,884	3.2	6	0.0	**1,934**	**3.3**
Building Construction	15	0.0	299	0.5	3	0.0	**317**	**0.5**
Non-Building Construction	190	0.3	2,002	3.4	45	0.1	**2,237**	**3.8**
Installation Trade Services	1,320	2.2	47,674	80.3	836	1.4	**49,830**	**83.9**
Total	**2,833**	**4.8**	**55,581**	**93.6**	**989**	**1.7**	**59,403**	**100.0**

Note: Census data in this table has been randomly adjusted by the ABS to avoid the release of confidential data.
Source: ABS Census of Population and Housing, 2001

Sex and age profile

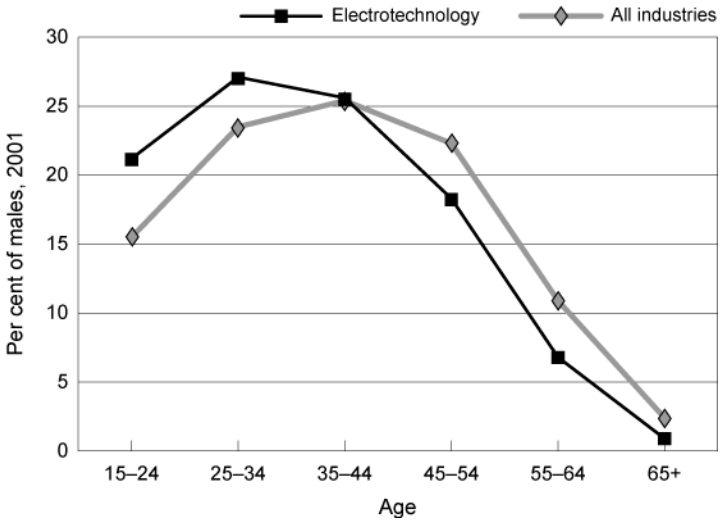
Gender

The electrical and communications workforce is overwhelmingly male, comprising 98.4% of the industry. The proportion of males in electrotechnology fields is significantly higher by comparison with Australian industry overall, in which males account for 54.4% of the labour market. Contractors confirmed this predominance of males in the interviews reported in Stage 2 of this report. Their comments suggested that almost all of the females employed in the industry worked in an office environment rather than in the field as tradespersons or technical staff. According to some contractors, a few were successfully employed in a management capacity. The predominance of males in the existing workforce is also reflected in training populations entering the industry, with a comparable proportion of males currently undertaking apprenticeships (see 'Supply of skills to the electrical and communications industry').

Age

The electrotechnology workforce tends to be younger by comparison with Australian industry generally, with nearly half of all workers in electrical and communications fields under the age of 35 compared with 39% across the Australian workforce as a whole.

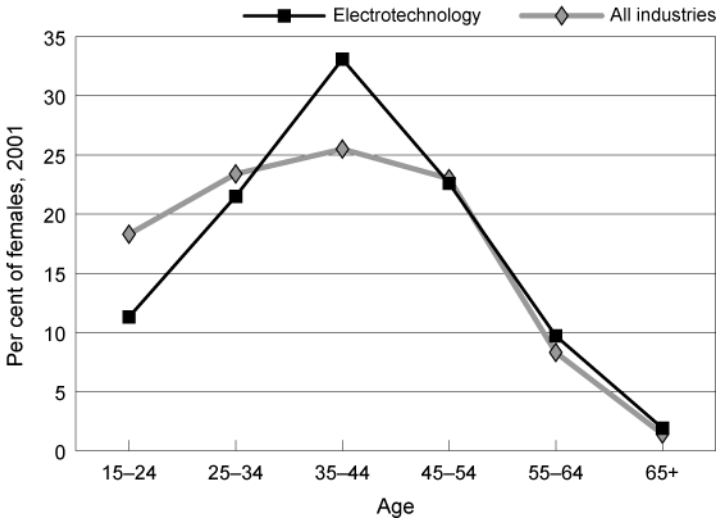
Figure 6: Proportion of males in electrotechnology and all industries, August 2001



Source: ABS Census of Population and Housing, 2001

While the electrotechnology workforce is generally comprised of younger males (peaking in the 25–34 age bracket), there is a crossover at the age of 35, with fewer older males after 44 than in the overall Australian labour force.

Figure 7: Proportion of females in electrotechnology and all industries, August 2001



Source: ABS Census of Population and Housing, 2001

In a similar comparison of age groups among female electrical and communications workers, an entirely different pattern emerges, with only a third of females working in the industry under the age of 35. Over half of all females in the electrotechnology workforce are between the ages of 35 and 54, with the numbers of female workers over 55 comparable with that of the general Australian workforce.

Table 7: Employment in electrical and communications occupations, by age and gender, August 2001

Sub-sector	Building & engineering associate professionals	Electrical & electronics tradespersons	Mining, construction & related labourers
Males			
15–24	289	11,825	288
25–34	765	14,808	269
35–44	818	13,945	226
45–54	553	10,001	115
55–64	241	3,711	41
65+	23	524	5
Total	**2,689**	**54,814**	**944**
Females			
15–24	13	91	3
25–34	43	154	6
35–44	59	239	15
45–54	20	185	15
55–64	6	81	6
65+	0	14	0
Total	**141**	**764**	**45**
Total persons	**2,830**	**55,578**	**989**

Note: Census data in this table has been randomly adjusted by the ABS to avoid the release of confidential data.
Source: ABS Census of Population and Housing, 2001

With such limited female participation in identified electrical and communications fields, however, (approximately 950 workers out of an industry of 59,400, accounting for only 1.6% of the established electrotechnology workforce), it is advisable to use caution when relying upon such data, given the large standard errors generated by this analysis.

Location

The geographic distribution of workers employed in the electrical and communications industry generally follows population trends, with a few exceptions in the case of some states and territories.

Table 8: Employment in the electrical and communications industry, by state, August 2001

State	15–24	25–34	35–44	45–54	55–64	65+	Total	%
New South Wales	4,793	5,595	5,412	3,784	1,354	206	**21,144**	35.6
Victoria	2,892	3,984	3,405	2,435	1,016	149	**13,881**	23.4
Queensland	2,150	2,848	2,943	2,128	771	107	**10,947**	18.4
South Australia	805	1,152	1,101	835	379	48	**4,320**	7.3
Western Australia	1,334	1,627	1,696	1,193	372	47	**6,269**	10.6
Tasmania	237	314	309	253	93	3	**1,209**	2.0
Northern Territory	130	233	206	126	45	5	**745**	1.3
Australian Capital Territory	168	292	230	130	55	8	**883**	1.5
Other territories	3	3	3	0	0	0	**9**	0.0
Total electrotechnology	12,512	16,048	15,305	10,884	4,085	573	**59,407**	100.0
Total all industries	**1,392,241**	**1,953,932**	**2,109,395**	**1,870,785**	**809,120**	**163,134**	**8,298,607**	**0.7**

Note: Data in this table has been randomly adjusted by the ABS to avoid the release of confidential data.
Source: ABS Census of Population and Housing, 2001

New South Wales, Western Australia and the Northern Territory all have a slightly higher proportion of employees in the electrotechnology industry than their general Census population distribution reflects, at +2.0%, 0.8% and 0.2% above population estimates, respectively.

Tenure

Typically, workers in electrotechnology fields are employed in their trade for longer than in Australian industry generally, with over 50% having worked in the industry for ten years or more. As the table below demonstrates, there are fewer entrants into electrotechnology occupations compared with other industries, with less than half the proportion of new entrants (those with a cumulative duration of under one year) and only a slight increase in the number of workers with medium-duration tenure within the industry (between one and five years).

Table 9: Cumulative duration of employment in current occupation in electrical and communications industry, employed persons aged 15–64 years, Australia, 2001

Duration	Weighted estimate ('000)			
	Electrotechnology		Australia	
	('000)	*%*	*('000)*	*%*
Under 1 year	5.6	7.1	1,405.1	15.3
1 <3 years	9.9	12.5	1,663.1	18.1
3 <5 years	8.9	11.2	1,145.6	12.4
5 <10 years	14.7	18.5	1,711.4	18.6
10 <20 years	20.6	25.9	1,798.4	19.5
20 years or more	19.7	24.8	1,478.8	16.1
Total	**79.4**	**100.0**	**9,202.5**	**100.0**

Note: The electrotechnology workforce is defined by NCVER as the intersection of 9 Occupation Unit groups with 6 Industry Groups. Occupations in 'electrotechnology' are ASCO-2 codes: 3123, 3124, 4311, 4312, 4313, 4314, 4315, 4316, & 9918. Industry groups in 'electrotechnology' are ANZSIC codes: 284, 285, 286, 411, 413, & 423. Data estimates for ANZSIC classifications at the 4-digit level are not available for this population survey.

Source: ABS Survey of Education, Training and Information Technology, 2001

Similarly, job tenure among new entrants within electrotechnology fields is relatively brief, consistent with the proportion of new workers gaining entry to the industry through apprenticeship arrangements with employers (including on-the-job training).

Table 10: Cumulative duration of employment in current job in electrical and communications industry, employed persons aged 15–64 years, Australia, 2001

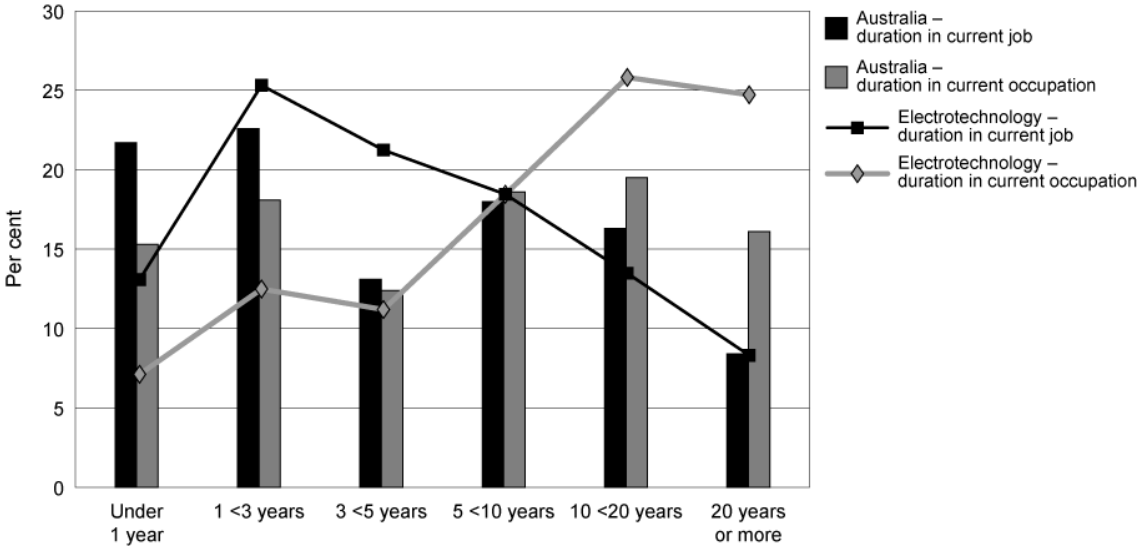
Duration	Weighted estimate ('000)			
	Electrotechnology		Australia	
	('000)	*%*	*('000)*	*%*
Under 1 year	10.4	13.1	2,001.2	21.7
1 <3 years	20.2	25.4	2,075.6	22.6
3 <5 years	16.9	21.3	1,203.7	13.1
5 <10 years	14.7	18.5	1,654.2	18.0
10 <20 years	10.7	13.5	1,496.5	16.3
20 years or more	6.6	8.3	771.4	8.4
Total	**79.4**	**100.0**	**9,202.5**	**100.0**

Note: The electrotechnology workforce is defined by NCVER as the intersection of 9 Occupation Unit groups with 6 Industry Groups. Occupations in 'electrotechnology' are ASCO-2 codes: 3123, 3124, 4311, 4312, 4313, 4314, 4315, 4316, & 9918. Industry groups in 'electrotechnology' are ANZSIC codes: 284, 285, 286, 411, 413, & 423. Data estimates for ANZSIC classifications at the 4-digit level are not available for this population survey.

Source: ABS Survey of Education, Training and Information Technology, 2001

By contrast, while job turnover within the industry is less frequent in medium-duration employment (one to five years) than in Australian industry generally, it becomes more common with time spent in the industry (five years or more). As shown in Figure 8, a clear pattern emerges of long-term tenure in electrotechnology occupations accompanied by increasing job turnover, with a crossover at five to ten years. So, while retention of workers within the industry remains very high, duration in the same job is less stable, even with continued employment in the same field. This supports the findings of the qualitative part of this report, in which retention of existing employees was identified as a key issue for the electrical and communications industry.

Figure 8: Cumulative duration of employment in current job by cumulative duration in current occupation, employed persons aged 15–64 years, Australia and electrical and communications industry, 2001



Source: ABS Survey of Education, Training and Information Technology, 2001

It should be noted that the electrotechnology workforce is higher in this estimate at 79,400 than in the estimate obtained using 2001 Census data (yielding approximately 59,400). This is due to the industry classification (ANZSIC) being collected at the 3-digit level only for this ABS survey. Consequently, the data parameters of the 2001 ABS Survey of Education, Training and Information Technology are more inclusive than those used to obtain other ABS and NCVER data, and include industry sub-sectors that were excluded as out of scope in other data analysis for this report.

Employment growth

In order to provide an estimation of industry and occupational growth over the past four to five years (since the most recent collection of Census data in 2001), a parallel workforce analysis was developed using the ABS Labour Force Survey for 2002–05.

As with other selected ABS surveys, such as the 2001 Survey of Education, Training and Information Technology, data were only available at an industry sub-group level (i.e. using 3-digit ANZSIC codes, rather than the lower-level 4-digit classifications used in the Census workforce profile.)

Allowing for the risk of over-inclusion of some associated industries, it is nonetheless useful to chart employment growth across industry and occupational sub-sectors using this comparative data. As demonstrated in Table 11, installation trades services not only employed the highest number of workers within the electrical and communications industry, but also showed the highest proportional growth over the past five years.

Table 11: Employment growth ('000) for grouped (4-digit ASCO) electrical and communications occupations by individual (3-digit ANZSIC) industries, May quarters 2002 to 2005 ('000s)

ANZSIC code	ANZSIC label	Census 2001	Labour Force Survey				Industry growth
			May quarter 2002	May quarter 2003	May quarter 2004	May quarter 2005	('000)
284	Electronic Equipment Manufacturing	4.5	3.1	4.0	2.1	3.5	-1.0
285	Electrical Equipment & Appliance Manufacturing	4.4	5.4	5.0	3.5	4.3	-0.1
286	Industrial Machinery & Equipment Manufacturing	2.9	3.7	4.0	3.3	2.8	-0.1
411	Building Construction	1.6	1.3	1.7	0.5	1.3	-0.3
412	Non-Building Construction	2.4	2.4	1.0	2.6	1.9	-0.5
423	Installation Trade Services	50.1	63.2	80.9	71.9	71.3	+21.2

Note: The identified electrical and communications industry Census population has been re-calculated at the 3-digit industry (ANZSIC) level to enable comparisons with Labour Force Survey data, which are only available at the 3-digit ANZSIC level. Consequently, the electro-communications workforce is shown at a higher estimate than that used in the bulk of this report, and risks over-inclusion of other associated sub-sectors, which have been excluded from the main Census analysis.

Source: ABS Census of Population and Housing, 2001; ABS Labour Force Survey, 2002–05

Employment within the construction sector showed a considerable degree of variability year to year due to economic influences, such as lending and interest rates, and trends in domestic and commercial construction. This is consistent with the findings from the DEWR Skilled Vacancies Index (see Figure 4).

Electrical equipment and appliance manufacturing reached a peak in 2002–03, before returning to the levels reported in the 2001 Census, while electronic equipment manufacturing was prone to greater fluctuation, with employment slowing in recent years, generating an estimated loss of up to 1,000 jobs in 2005. This represents the most significant reduction in employment across each of the industry sub-sectors.

Table 12: Employment growth for grouped (3-digit ANZSIC) electrical and communications industries by individual (4-digit ASCO) occupations, May quarters 2002 to 2005, ('000s)

ASCO code	ASCO label	Census 2001	Labour Force Survey				Growth in occupation
			May quarter 2002	May quarter 2003	May quarter 2004	May quarter 2005	('000)
3123	Electrical Engineering Associate Professionals	1.5	0.5	1.7	1.2	2.6	+1.1
3124	Electronic Engineering Associate Professionals	2.2	1.9	2.7	1.9	2.0	-0.2
4311	Electricians	47.1	58.4	70.9	61.6	59.4	+12.3
4312	Refrigeration & Airconditioning Mechanics	8.0	9.4	14.7	10.6	12.2	+4.2
4313	Electrical Distribution Tradespersons	0.8	0.5	*	*	1.7	+0.9
4314	Electronic Instrument Tradespersons	0.1	*	0.2	*	0.2	+0.1
4315	Electronic & Office Equipment Tradespersons	3.5	3.7	3.4	5.7	3.3	-0.2
4316	Communications Tradespersons	1.6	2.1	1.0	1.6	2.4	+0.8
9918	Electrical & Telecommunications Trades Assistants	1.1	2.6	2.0	1.3	1.3	+0.2

Note: * Number too low to be reported.
The identified electrical and communications industry Census population has been re-calculated at the 3-digit industry (ANZSIC) level to enable comparisons with Labour Force Survey data, which are only available at the 3-digit ANZSIC level. Consequently, the electro-communications workforce is shown at a higher estimate than that used in the bulk of this report, and risks over-inclusion of other associated sub-sectors, which have been excluded from the main Census analysis.

Source: ABS Census of Population and Housing, 2001; ABS Labour Force Survey, 2002–05

As with installation trade services (see Table 11), jobs for electricians reached a peak in 2003, reflecting the intersection in the electro-communications industry of electricians and installation trades, with both groups having shown considerable growth since 2001. The more widespread rate of growth across occupations compared with industry sub-sectors is accounted for by the gap between installation trade services (a growth of 21,200 jobs), compared with electricians (12,300 new jobs) between 2001 and 2005.

The rise in demand for installation trades also accounts for the considerable growth in refrigeration and airconditioning occupations, at a rate of over 50% in less than five years. This is consistent with findings from NCVER training data, which show enrolments rising in electrotechnology courses in refrigeration and airconditoning (e.g. UTE30999: Certificate III in Electrotechnology Refrigeration and Air Conditioning), across both apprenticeships and other VET courses. (See 'Supply of skills to the electrical and communications industry'.)

Skills profile of the existing electrical and communications workforce

The electrical and communications workforce has a higher proportion of post-school qualifications than the overall Australian workforce, with only 18.1% of workers employed in the industry possessing no post-school qualifications, in contrast to over 47% for Australian industry generally.

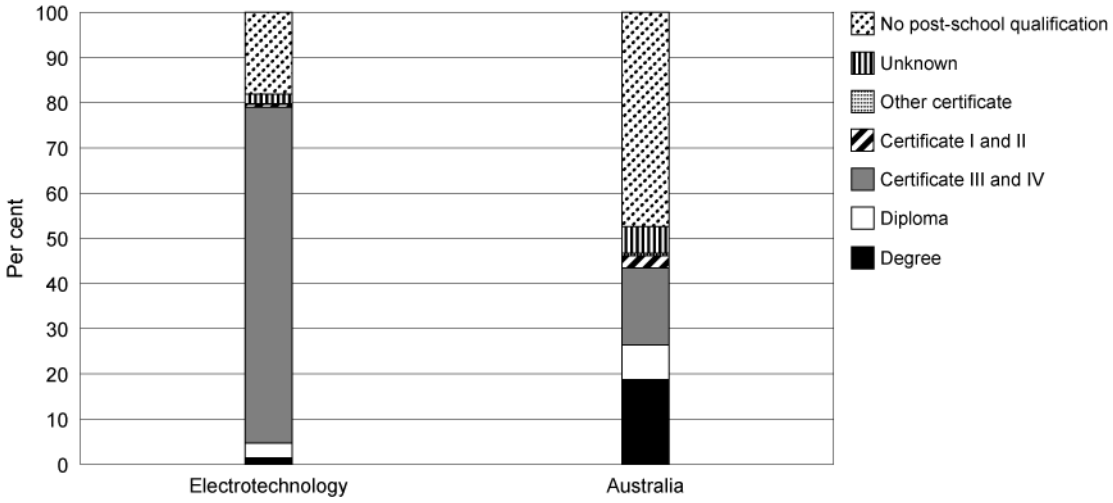
Table 13: Highest post-school qualification in electrical and communications workforce, 2001 (%)

Level of qualification	Electrical & communications industry		Australia	
	Number employed	%	Number employed	%
Degree	836	1.4	1,552,870	18.7
Diploma	1,964	3.3	642,721	7.7
Certificate	44,586	75.1	1,684,715	20.3
Certificate III & IV	*44,127*	*74.3*	*1,408,395*	*17.0*
Certificate I & II	*347*	*0.6*	*223,764*	*2.7*
Other certificate	*112*	*0.2*	*52,556*	*0.6*
Unknown	1,269	2.1	485,634	5.9
No post-school qualification	10,753	18.1	3,932,661	47.4
Total	**59,408**	**100.0**	**8,298,601**	**100.0**

Note: Census data in this table has been randomly adjusted by the ABS to avoid the release of confidential data.
Source: ABS Census of Population and Housing, 2001

The electrotechnology workforce also has considerably more technical skills, with nearly three-quarters of post-school training concentrated at the certificate III and IV levels, and very little training activity at either the lower certificate levels, or in higher VET (e.g. diploma) or tertiary education.

Figure 9: Highest post-school qualification in electrical and communications workforce, 2001 (%)



Source: ABS Census of Population and Housing, 2001

This compares with all industries which have a more even distribution across degree, diploma and certificate levels, but a higher unskilled population, with nearly half of all workers without any form of post-school qualification.

A comparison of highest level of schooling (Table 14) shows less difference in the skills base between electrotechnology and other industries, with electrical and communications fields attracting more school leavers at the Year 10/11 level or equivalent, and fewer Year 12 completers. This reflects the uptake of apprenticeships in the post-compulsory years, and is also indicative of the lower proportion of workers with degrees in the industry (these are usually Year 12 completers).

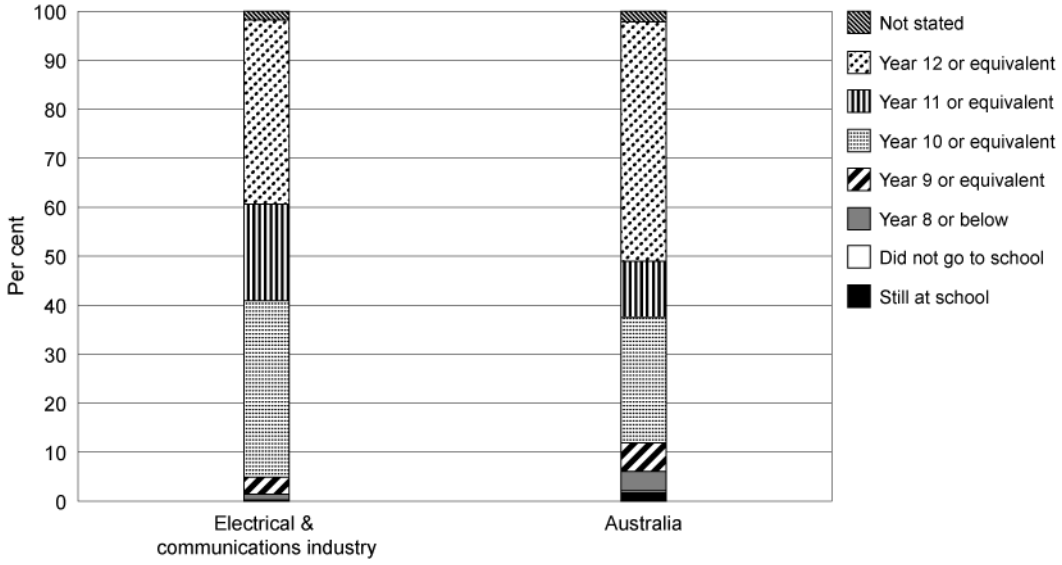
Table 14: Highest level of schooling in electrical and communications workforce, 2001 (%)

Level of schooling	Electrical & communications industry		Australia	
	Number employed	%	Number employed	%
Still at school	109	0.2	146,594	1.8
Did not go to school	51	0.1	30,815	0.4
Year 8 or below	706	1.2	330,336	4.0
Year 9 or equivalent	2,047	3.4	478,418	5.8
Year 10 or equivalent	21,404	36.0	2,129,068	25.7
Year 11 or equivalent	11,686	19.7	947,016	11.4
Year 12 or equivalent	22,349	37.6	4,055,470	48.9
Not stated	1,056	1.8	180,889	2.2
Total	**59,408**	100.0	**8,298,606**	100.0

Note: Census data in this table has been randomly adjusted by the ABS to avoid the release of confidential data.
Source: ABS Census of Population and Housing, 2001

While the electrical and communications industry generally has a lower proportion of Year 12 completers entering the industry, it has a higher level of schooling overall, with 93.3% of workers having completed Year 10 or above.

Figure 10: Highest level of schooling in electrical and communications workforce, 2001 (%)



Source: ABS Census of Population and Housing, 2001

Supply of skills to the electrical and communications industry

Use of training packages

The following training packages were identified as relevant to the electrical and communications industry.

Table 15: Training packages identified with electrical and communications industry

National code	Training package name	Endorsement date
UTE99	Electrotechnology Industry	21/07/1999
ICT02	Telecommunications	30/09/2002
ICT97	Telecommunications (superseded by ICT02)	23/09/1997
UTL98	Lifts Industry	04/12/1998

Source: National Training Information Service 2005

Other packages, such as those associated with the Electricity Supply Industry (UTP98 Electricity Supply Industry – Generation; and UTT98 Electricity Supply Industry – Transmission and Distribution) were excluded as being out of scope of the industry.

Training packages relating to the lifts and telecommunications industries have in most cases been included separately (at the disaggregated level), to aid analysis of sub-sector training activity.

Time series

The Telecommunications Training Package ICT97 was superseded by ICT02 on 30 September 2002, although training activity under the older qualification arrangements continues to be reported in current estimates (e.g. in apprenticeship commencements for March 2005).

Courses and qualifications

Student numbers in old and new course streams have been listed separately in the raw data (see Tables A6 and A8 in Appendix B), but as an aggregate in the subsequent data analysis in order to provide an accurate representation of total training activity in each qualification.

Electrotechnology

All qualifications from the Electrotechnology Training Package were included in this analysis as falling directly within the electrical and communications industry sectors. A full list of all courses included in this analysis is included in Appendix B.

Lifts industry

Qualification streams concerned with non-electrical maintenance and operational support within the lifts industry were excluded as out of scope of this report. Electrical qualifications have only been included in the data analysis, although in recent years, the number of commencements in this package has been too low to report.

Telecommunications

Non-technical qualifications from the current ICT02 Telecommunications Training Package were excluded from this data analysis, as were qualification streams concerned with Call Centre training and operation under the superseded ICT97 Telecommunications Training Package.

New Apprenticeships

Ninety per cent of all apprenticeship commencements in Electrotechnology (UTE) Training Package qualifications in 2004 were classed as traditional apprenticeships, compared with only 3.7% of Telecommunications (ICT) commencements. Students in Lifts Industry (UTL) Training Packages, while few, tended to be enrolled in traditional apprenticeship programs.

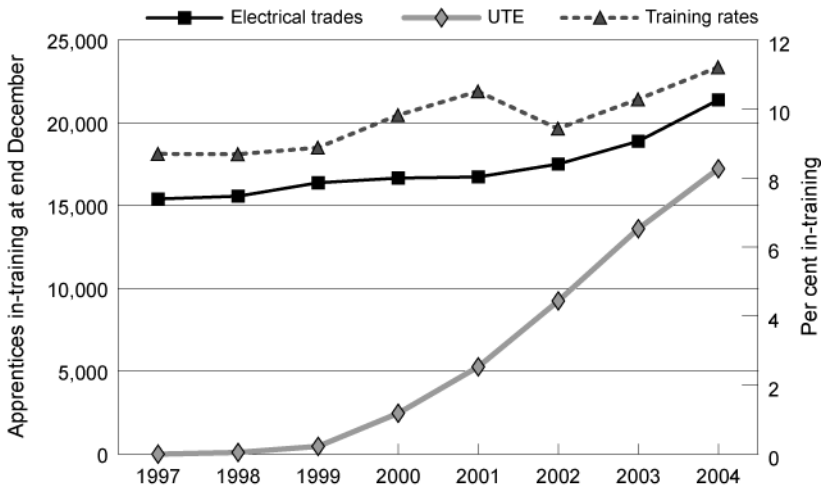
With electrotechnology (UTE) courses forming the bulk of training delivered to the electrical and communications industry, 'New Apprenticeships'—encompassing both apprentice and trainee programs—will be referred to as 'apprenticeships' in the body of this report for reasons of

expediency. It should be acknowledged, however, that the majority of telecommunications (ICT) training is not delivered as traditional apprenticeships.

Training activity

Electrotechnology (UTE) packages account for some 96.3% of identified electrical and communications apprenticeship training, with Telecommunications (ICT) packages comprising only 3.7% of all electro-communications enrolments, with 298 apprenticeship commencements in 2004. After a decrease in the number of ICT commencements in 2001–03, telecommunications enrolments are rising to more closely align to the levels of previous years (recorded as 348 commencements in 1999).

Figure 11: Apprenticeship in-training rates in Electrotechnology Industry Training Package and electrical trades, 1997 to 2004

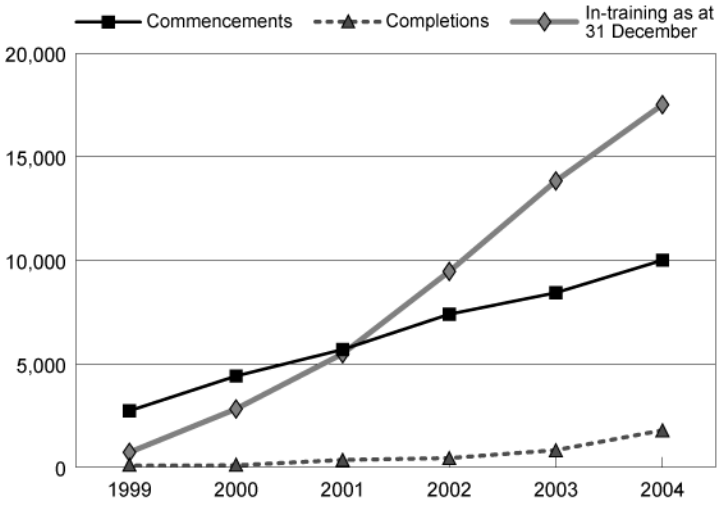


Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

When charted against apprentices employed within electrical trades and the overall training rate (see Figure 11), we can see the growth in electrotechnology training rising to meet demand.

A comparison of commencement, completion and in-training apprenticeship data is shown in Figure 12, reflecting the steady increase of apprentices in-training in industry training packages upon their introduction in 1999, with a steeper increase after 2001.

Figure 12: Apprenticeship training rates (commencements, completions and in-training) in selected Electrical and Communications Industry Training Packages, 12 months to December, 1999 to 2004



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

As demonstrated in Figure 13, while employment growth for electrical and electronics tradespersons has fluctuated considerably over the past decade, overall apprenticeship completions have remained more or less consistent.

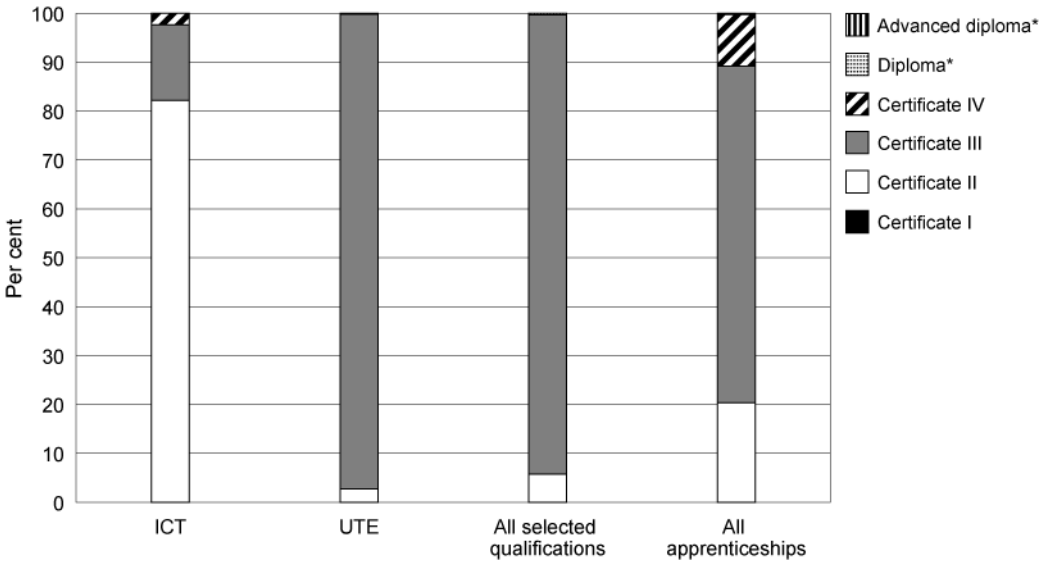
Figure 13: Employment growth and apprenticeship completions in selected Electrical and Communications Industry Training Packages, 12 months to December 1999 to 2004

Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Level of qualification

Almost all commencements in Electrotechnology (UTE) apprenticeships were at the Certificate III level, while the majority of Telecommunications (ICT) apprentices were enrolled in Certificate II qualifications.

Figure 14: Apprentice and trainee commencements 12 months to December 2004, by selected training package qualifications by age, Australia



Note: Based on June 2005 estimates. * Diploma and advanced diploma qualifications are not available in UTE and ICT apprenticeships and traineeships.

Source: NCVER, unpublished statistics

Commencements

Electrotechnology Training Packages (UTE)

Apprenticeship commencements in Electrotechnology Training Packages vastly exceeded those in the adjunct industries of telecommunications and the lifts industry, with over 7,700 commencements in the 12 months to December 2004. Estimates for the most recent training quarter show that this figure is likely to be exceeded for 2005, with over 4,000 commencements in the March 2005 quarter alone.

The higher proportion of apprentice and trainee commencements in electrotechnology qualifications—as distinct from those in telecommunications and the lifts industry—is consistent with the composition of the industry workforce in general, with electricians accounting for some 74.3% of the total electrical and communications workforce (across all identified industries), with electrotechnology-related occupations comprising 92.6% of the total electro-communications workforce (ABS Census of Population and Housing, 2001).

Table 16: Comparison of identified electrical and communications sub-industry workforce (Census) with apprentice and trainee commencements in selected Electrical and Communications Industry Training Packages, 12 months to December 2004

Electrical & communications industry sub-groups	Apprentice & trainee commencements, 12 months to December 2004		Industry workforce estimation, 2001	
	Count	%	Count	%
Sub total – Electrotechnology	7,703	96.3	55,017	92.6
Sub total – Telecommunications	298	3.7	2,452	4.1
Sub total – Lifts Industry	1	0.0	1,934	3.3
Total	**8,002**	**100.0**	**59,403**	**100.0**

Note: Industry workforce estimation was calculated by subtotalling electrotechnology-related occupations (ASCO2 codes: 3123, 3124, 4312, 4313, 4314, 4315) and Telecommunications occupations (4316, 9918) across all industries except 2865 Lifting and Material Handling Equipment Manufacturing. The lifts industry was derived by subtotalling ANZSIC code: 2865 across all occupations.

Source: ABS Census of Population and Housing, 2001; unpublished NCVER statistics

There has been a steady rise in enrolments in UTE qualifications since the introduction of the UTE99 Electrotechnology Industry Training Package in July of 1999, with the Certificate III in Electrotechnology Systems (UTE31199) essentially serving as the core qualification for apprentices in the industry. Just over three-quarters (78.7%) of all commencements were in this qualification, with comparable proportions in previous years. In total, 97% of all electrotechnology apprenticeship commencements were at the certificate III level, with minimal numbers in certificate II and IV qualifications.

The most popular courses offered under the UTE Training Package are shown in Table 17.

Table 17: Highest number of commencements in Electrotechnology Training Package qualifications, apprentice and trainee commencements, 12 months to December 2003 and 2004, Australia

UTE Training Package qualification	2003	2004	March 2005 quarter
UTE31199 – Certificate III in Electrotechnology Systems Electrician	4,842	6,064	3,225
UTE30999 – Certificate III in Electrotechnology Refrigeration & Air Conditioning	637	909	487
UTE20502 – Certificate II in Electrotechnology Servicing (including UTE20599 [superseded by UTE20502])	232	174	70
UTE30402 – Certificate III in Electrotechnology Communications (including UTE30499 [superseded by UTE30402])	119	118	43
UTE30199 – Certificate III in Electrotechnology Assembly & Servicing	128	102	35
UTE30702 – Certificate III in Electrotechnology Entertainment & Servicing (including UTE30799 [superseded by UTE30702])	83	80	40
UTE30899 – Certificate III in Electrotechnology Instrumentation	49	69	43
UTE30299 – Certificate III in Electrotechnology Building Services	39	54	18
UTE30599 – Certificate III in Electrotechnology Computer Systems	46	40	17
UTE30699 – Certificate III in Electrotechnology Data Communications	32	24	19
UTE30104 – Certificate III in Electrotechnology Assembly & Servicing	0	10	32

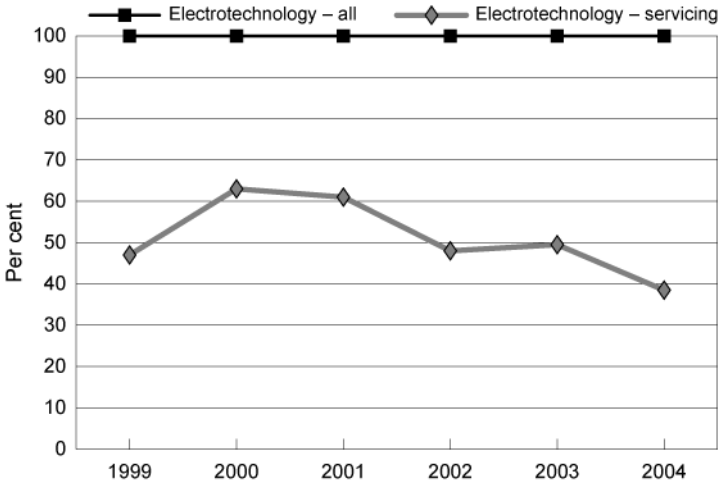
Note: Based on June 2005 estimates.

Source: NCVER, unpublished statistics

As with UTE31199, enrolment in the primary Refrigeration and Air Conditioning qualification (UTE30999) has shown considerable growth in recent years. In 2004, students in the Certificate III in Electrotechnology Refrigeration and Air Conditioning (UTE30999) accounted for 11.8% of all electrotechnology apprenticeship commencements. Commencements for the March 2005 quarter (approximately 487) are currently estimated at more than 50% of those recorded for the whole of the previous year (909).

By comparison with overall electrotechnology commencements, there has been a small but perceptible decline in the proportion of enrolments in servicing courses such as the Certificate II in Electrotechnology Remote Area Essential Services Operations (UTE20499). Commencements in the Certificate II in Electrotechnology Servicing (UTE20502, formerly UTE20502 and UTE20599) reached a peak of 232 commencements in 2003, but have since returned to 2001–02 levels of approximately 175 students.

Figure 15: Apprenticeship commencements in electrotechnology servicing qualifications, 12 months to December, 1999–2004, by training package qualification, Australia



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Shown as a percentage of total enrolments from 1999–2004 (Figure 15), with commencements across all electrotechnology courses represented as a topline measure, a degree of fluctuation in the take-up of servicing courses can be identified, with a gradual decline after 2001. While enrolments in UTE servicing qualifications actually peaked in 2003, with 502 commencements (accounting for 24.8% across the past five years), this is diminished when compared with the overall trend for electrotechnology apprenticeships, which has seen a constant rise in commencements since the introduction of the UTE Training Package in 1999.

Electrical and electronic trades occupations

In the 12 months to December 2004, there were 9,169 apprenticeship and traineeship commencements with an occupational classification as an Electrical or Electronic Tradesperson (ASCO 43). Of these, 9,097 (99.2%) used training packages, with only the remaining 0.8% (72 commencements) not enrolled in industry-sponsored programs.

Commencement data showed that there was a clear fit between the identified UTE, ICT and UTL Training Packages and those engaged as electrical or electronic tradespersons. Where there was training activity outside the Electrical and Communications Training Packages identified in the scope of this project, enrolments fell into Metal and Engineering Industry qualifications and packages catering to the Electricity Supply Industry (Transmission and Distribution).

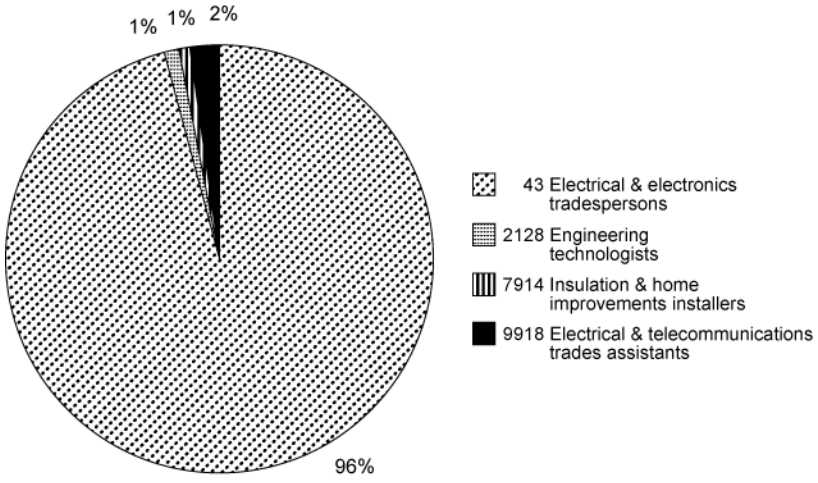
Table 18: Apprentice and trainee commencements for electrical and electronic tradespersons (ASCO 43), by training package qualifications, 12 months to December 2004, Australia

Training package qualifications	Number of commencements
UTE – Electrotechnology Industry	7,467
ICT – Telecommunications	67
UTL – Lifts Industry	1
Other	
MEM – Metal & Engineering Industry	**1,103**
MEM30298 – Certificate III in Engineering – Mechanical Trade	237
MEM30498 – Certificate III in Engineering – Electrical/Electronic Trade	866
UTT – Electricity Supply Industry – Transmission & Distribution	**459**
UTT30101 – Certificate III in ESI – Distribution (Powerline)	179
UTT30198 – Certificate III in ESI – Distribution (Powerline) (replaced by UTT30101)	235
UTT30298 – Certificate III in ESI – Transmission (Powerline)	6
UTT30301 – Certificate III in ESI – Cable Jointing (Powerline)	15
UTT30402 – Certificate III in ESI – Rail Traction (Powerline)	23

Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Conversely, of those apprenticeship commencements in the Electrotechnology Training Package (UTE99), 96% were identified as having an occupational classification as an Electrical or Electronic Tradesperson (ASCO 43).

Figure 16: Apprentice and trainee commencements 12 months to December 2004 for UTE Training Package by occupation group, Australia



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Telecommunications

Eighty-two per cent (82%) of all apprenticeships commencements in Telecommunications Training Packages were at the certificate II level. While there were 55 reported commencements in the (now superseded) Diploma of Telecommunications Engineering (ICT50197) in 2000, no apprentices or trainees have commenced in qualifications above the certificate IV level since the introduction of the new ICT Training Package in 2002. Given industry apprenticeship arrangements under AQF guidelines, there were also no commencements below the certificate II level.

The most popular telecommunications qualification for apprenticeship commencements in recent years was the Certificate II in Telecommunications Cabling (ICT20302), with 141 commencements

in the 12 months to December 2004. The other two most popular courses in telecommunications likewise showed a clear rise in enrolment numbers between 2003 and 2004, with the introduction of the new package (following a general decline in telecommunications commencements in 2001–02).

Overall, the most popular courses in technical telecommunications fields are as shown in Table 19.

Table 19: Highest number of commencements in Telecommunications Technical Training Package qualifications, apprentice and trainee commencements, 12 months to December 1999–2004, and March 2005 quarter, Australia

ICT Training Package qualification	1999	2000	2001	2002	2003	2004	March 2005 quarter
ICT20302 – Certificate II in Telecommunications Cabling (including ICT20297 [superseded by ICT20302])	188	86	43	38	33	141	30
ICT20202 – Certificate II in Telecommunications (including ICT20197 [superseded by ICT20202])	64	24	33	32	47	104	91
ICT30202 – Certificate III in Telecommunications (including ICT30197 [superseded by ICT30202])	65	65	20	22	20	31	21

Note: Based on June 2005 estimates.

Source: NCVER, unpublished statistics

In the most recent quarterly estimates, the Certificate II in Telecommunications under the new training arrangements (ICT20202) is nearing the number of commencements for the previous 12 months, with 91 commencements in 2005 as of March.

The most popular course after those listed above was the Certificate III in Telecommunications Cabling and Customer Premises Equipment (ICT30302). This continued to show a steady stream of enrolments over the past five years and followed a different trend from commencements in other telecommunications qualifications, with peak enrolments in 2001–02.

Table 20: Other commencements in Telecommunications Technical Training Package qualifications, apprentice and trainee commencements, 12 months to December 1999–2004, and March 2005 quarter, Australia

ICT Training Package qualification	1999	2000	2001	2002	2003	2004	March 2005 quarter
ICT30302 – Certificate III in Telecommunications Cabling and Customer Premises Equipment (including ICT30497 [superseded by ICT30302])	5	13	19	23	15	14	8
ICT40202 – Certificate IV in Telecommunications Engineering	0	0	0	0	0	7	1

Note: Based on June 2005 estimates.

Source: NCVER, unpublished statistics

Lifts industry

As shown in Table 16, there is an apparent gap between those employed in the lifts industry (3.3%) and the very low participation in electrical qualifications in the Lifts Industry Training Package (UTL98) (close to 0%, with only a few enrolments in previous years, peaking in 2002 with 25 new commencements).

The higher volume of training activity in 2000–03 compared with recent years suggests that training in electrical services to the lifts industry has become subsumed by Electrotechnology (UTE) packages, with more apprentices training for accreditation within a chosen occupation (e.g. electrician) than targeting a specific industry for future employment. This is borne out by the workforce data obtained using the 2001 Census, in which 1,872, or nearly 97%, of those employed

in the lifts industry were classified as Electricians (ASCO2 code: 4311), with a small number employed as Electrical Engineering Associate Professionals (3123).

Student characteristics

Gender

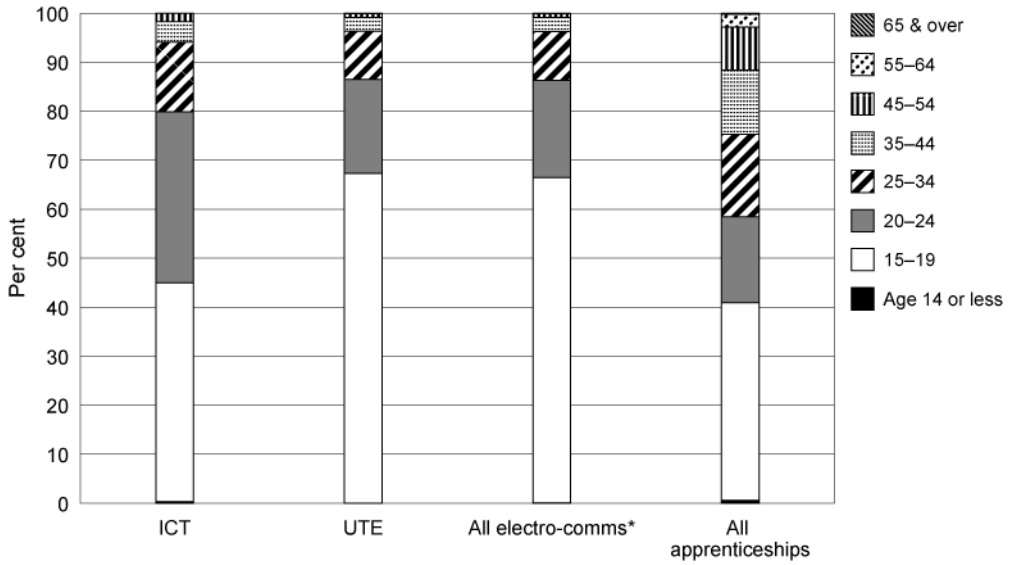
With 98.6% of current UTE apprenticeships being undertaken by males, the predominance of males in the electrotechnology sector is likely to be maintained into the future.

The gender breakdown of commencements in Electrotechnology (UTE) Training Packages is consistent with the historical demographics of the electrical and communications industry, with a defined population of 98.4% males, according to the most recent Census data (ABS Census of Population and Housing, 2001).

Age

- The average age of all apprenticeship commencements across Electrical and Communications Training Packages was 20.3 years, including:
  - Telecommunications (ICT): 19.7 years
  - Electrotechnology (UTE): 20.4 years
  - Lifts industry (UTL): N/A—unable to report age for single commencement in current annual data collection (12 months to December 2004).

Figure 17: Apprentice and trainee commencements 12 months to December 2005 in selected Electrical and Communications Industry Training Packages, by age



Note: *An age breakdown for the lifts industry (selected UTL Training Package qualifications) was unable to be provided, as only one apprentice commenced training in the 12 months to December 2004; based on June 2005 estimates.

Source: NCVER, unpublished statistics

Apprentices in UTE Training Packages are slightly younger than those in Telecommunications (ICT) packages, with a higher number of apprentices between the ages of 15 and 19 and fewer commencements after the age of 25. When taken as a comparison against the age distribution of all apprentice and trainee commencements (Figure 17):

- 86.3% of electrotechnology apprentices were under 25 years old, compared with 57.8% of apprentices in general
- there were considerably fewer (2.9%) electrotechnology apprentices in the 35 to 44-age bracket, in contrast to 13.1% across all sectors

- a negligible number (less than 1%) of UTE apprentices were aged 45 or over, compared with 11.7% across all apprenticeship commencements.

Indigenous

Participation of Indigenous students in electrical and communications training was slightly lower than general population levels, with 1.5% of all apprentices identifying as Aboriginal or Torres Strait Islanders. (The overall Indigenous population of Australian was estimated by the ABS as approximately 458,500, or 2.4% of the total population as at 30 June 2001 [2001 Census, revised 2003].) However, estimated Indigenous participation in training may be slightly higher than that reported, with 1.9% of commencements having an unknown recorded Indigenous status.

While the participation of Indigenous students in UTE training was relatively low at 1.5%, the proportion of commencements in telecommunications training was actually higher than general population levels, with 2.7% of all students in technical ICT courses identifying as Indigenous.

In some qualifications offered under the UTE and ICT Training Packages, the number of commencements for Indigenous students was proportionally high against overall population levels:

- UTE30699 Certificate III in Electrotechnology Data Communications – 8.3%
- UTE20502 Certificate II in Electrotechnology Servicing – 5.3%
- ICT20202 Certificate II in Telecommunications – 3.8%
- ICT20302 Certificate II in Telecommunications Cabling – 3.1%.

In the case of the Certificate II in Electrotechnology Remote Area Essential Services Operations (UTE20499), 100% of student commencements (26 individuals) were Indigenous, and training as Essential Services Operator Trainees under the Indigenous ESO program, which is jointly delivered by Group Training NT (GTNT), Power and Water and Charles Darwin University (Northern Territory), to deliver training to Top End communities.

Location

A comparison of apprenticeship commencements in the 12 months to December 2004, charted against the overall Australian electrical and communications workforce (see Table 8: 'Employment in the electrical and communications industry, by State', 2001 Census) illustrates the states and territories in which take-up of training is commensurate to workforce participation across the industry.

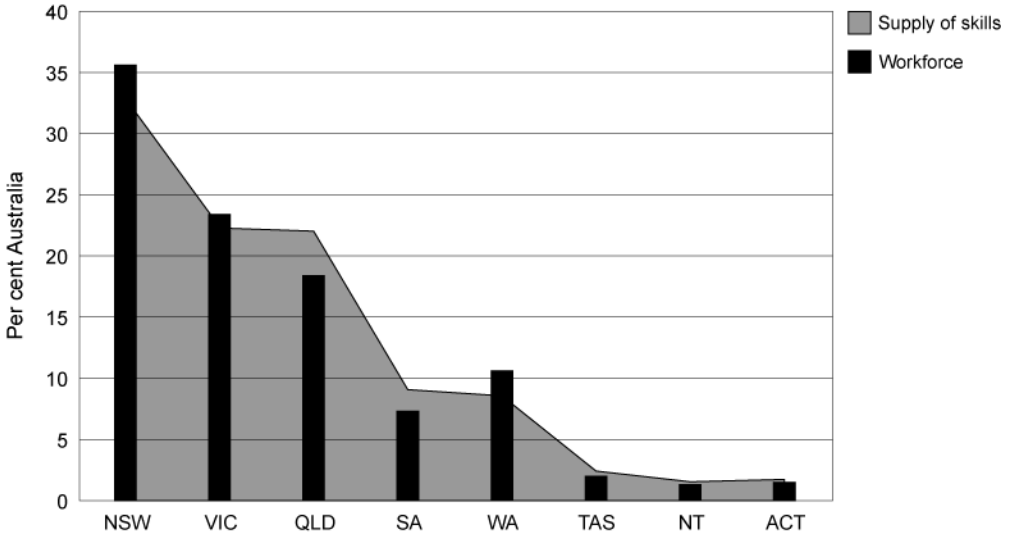
Table 21: Apprentice and trainee commencements, 12 months to December 2004 by selected training package qualifications, state/territory

State	ICT	UTE	UTL	Total electrocomms	% of Australian electrocomms apprenticeship commencements, 2004	% of Australian electrocomms workforce, 2001
New South Wales	89	2,537	1	2,626	32.8	35.6
Victoria	59	1,701	0	1,760	22.0	23.4
Queensland	85	1,662	0	1,747	21.8	18.4
South Australia	26	702	0	728	9.1	7.3
Western Australia	32	664	0	696	8.7	10.6
Tasmania	3	191	0	194	2.4	2.0
Northern Territory	3	115	0	118	1.5	1.3
Australian Capital Territory	0	131	0	131	1.6	1.5
Australia	298	7,703	1	8,002	100.0	100.0

Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

While a degree of caution should be used in relying too heavily on these data—given the time lapse between the workforce analysis (2001 Census of Population and Housing) and apprenticeship data collection (12 months to December 2004, based on June 2005 estimates)—they are nonetheless useful in providing a comparative view of the supply of skills and the demand for labour across Australian states and territories.

Figure 18: Apprentice and trainee commencements 12 months to December 2004 by selected training package qualifications, state/territory; and employment in electrical and communications industry, by occupation, August 2001



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics; ABS Census of Population and Housing, 2001

As shown in Figure 18, South Australia, Tasmania and the Northern Territory have a lower percentage of the total Australian electrical and communications workforce compared with their respective populations, which demonstrates economic rather than population trends (e.g. fluctuations in construction and manufacturing sectors). In these states and territories, as in Queensland, the take-up of apprenticeships and traineeships is adequate to the demand for labour in the industry.

In New South Wales, Victoria and Western Australia, however, the labour force outstrips the supply of apprenticeships, with New South Wales reflecting the largest gap between its share of Australia's estimated electro-communications industry (35.6%), and apprenticeship commencements (32.8%). As with Victoria, however, other VET enrolments more than make up for this apparent gap (see Figure 27), with the supply of (non-apprenticeship) training in those states eclipsing their respective market shares as a proportion of the Australian total.

Previous education

Results from the 2004 Student Outcomes Survey (NCVER) showed that:

- 56.3% of (technical) telecommunications apprentices and 15.6% of electrotechnology apprentices were granted some form of recognition of prior learning towards their training.
- Apprentices who had successfully completed all requirements of their apprenticeship program ('graduates') generally had a higher level of pre-training schooling than those who did not complete the requirements of their apprenticeship ('module completers'), with:
  - the majority (55.4%) of non-completing apprentices having attained Year 10 or equivalent as their highest pre-training schooling, compared with only 8% among graduates
  - 79.4% of graduate apprentices having completed Year 12 or equivalent prior to undertaking their training, compared with the 36.3% of apprentices who did not complete their training.

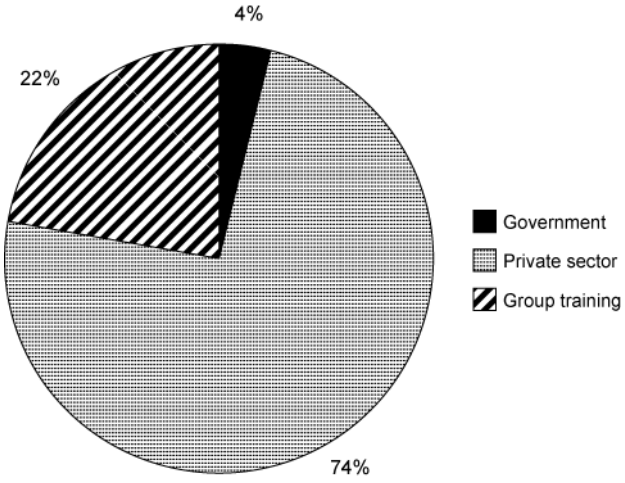
- Successful completers of apprenticeship programs generally started training within 12 months of leaving school (57.9% compared with 28.2% of non-completers), with 39.6% starting more than 12 months after leaving school, compared with the majority (71.8%) of non-completing apprentices.
- While non-completing apprentices had lower levels of pre-training schooling, they tended to have engaged in other forms of VET study prior to undertaking their apprenticeships, with 65.1% of module completers compared with 16.8% of graduate apprentices. This is attributable in part to the majority of graduate apprentices being younger, and having enrolled in apprenticeship training soon after leaving school, with a small proportion (2.5%) having started training while still at school.

Employer characteristics

Employer type

As anticipated, the majority of apprentices undertaking electrotechnology (UTE) Training Package qualifications were employed in the private sector, with very few (4%) employed in the public/government sector.

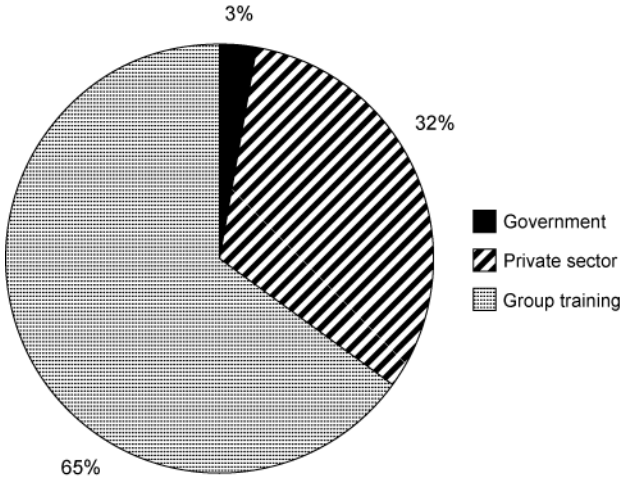
Figure 19: Apprentice and trainee commencements 12 months to December 2004 for the UTE Electrotechnology Training Package, by employer type



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

By comparison, while a similarly small proportion of telecommunications (ICT) apprentices were employed in the public sector, a majority of 65% were employed through arrangements with group training organisations, with only 32% employed in the private sector.

Figure 20: Apprentice and trainee commencements 12 months December 2004 for selected ICT Telecommunications Training Package qualifications, by employer type

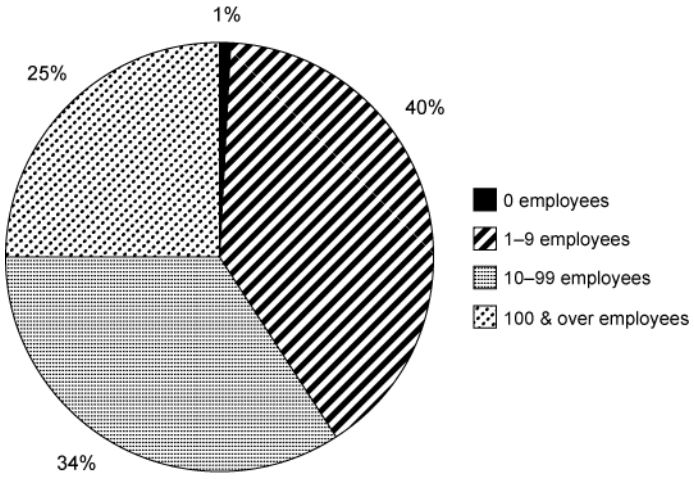


Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Employer size

Most electrotechnology apprentices were employed in small (1–9) or medium (10–99) organisations, with a negligible proportion self-employed.

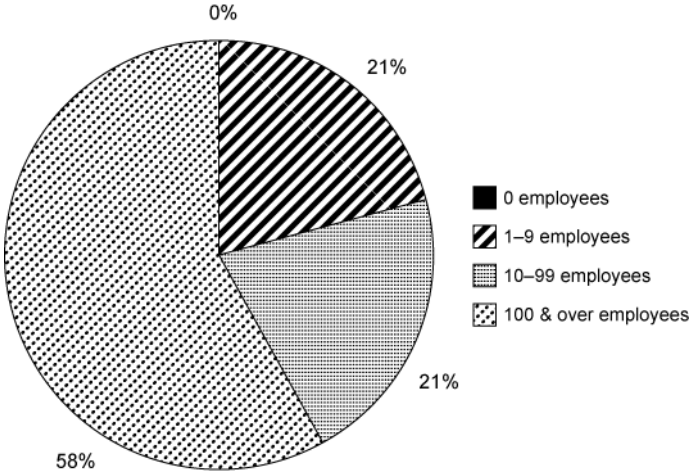
Figure 21: Apprentice and trainee commencements 12 months to December 2004 for the UTE Electrotechnology Training Package, by employer size



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

In contrast, the majority of telecommunications apprentices worked in large organisations (100 employees and over).

Figure 22: Apprentice and trainee commencements 12 months to December 2004 for selected ICT Telecommunications Training Package qualifications, by employer size



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Training outcomes

Reasons for training

Ninety-seven per cent (97%) of all electrotechnology (UTE) and telecommunications (ICT) apprentices surveyed gave employment-related reasons as the main motivation for undertaking training, with only 3% citing further study and/or personal development as their main reason for undertaking an apprenticeship.

Table 22: Main reason for undertaking training, electrotechnology (UTE) and telecommunications (ICT) apprentices, 2004 Student Outcomes Survey (2003 graduate cohort)

Main reason for undertaking training	Count	%
To get a job	196	12.2
To develop my existing business	0	0.0
To start my own business	114	7.1
To try for a different career	212	13.2
To get a better job or promotion	0	0.0
It was a requirement of my job	940	58.5
I wanted extra skills for my job	97	6.0
To get into another course of study	47	2.9
For interest or personal reasons	0	0.0
Other reasons	0	0.0
Total	**1,606**	**100.0**

Source: 2004 Student Outcomes Survey, NCVER

Of students surveyed, 58.5% said that they undertook apprenticeship training for the primary reason that it was a requirement of their job, rather than other work-related or personal reasons.

Reasons for non-completion

Results from the 2004 Student Outcomes Survey show that, out of the 2,043 survey participants undertaking the selected ICT and UTE Training Packages, approximately one in five did not complete all the requirements for their apprenticeship or traineeship. Of those students, the most common reasons given for discontinuing their training were job or training-related, including:

- ‘the training was not what I expected’ – 34.5%

- ‘I achieved my training goals’ – 15.9%
- ‘changed jobs or started a new job’ – 7.3%
- ‘I learnt the skills I needed for my job’ – 6.7%.

Personal reasons accounted for a minority (30.9%) of non-completions, including illness at 29.2% (NCVER Student Outcomes Survey, 2004).

Training achievements

Practically all (99.5%) apprentices considered that they had wholly or partly achieved their main reason for undertaking training.

The most common job-benefits reported after training were[8]:

- an increase in earnings (66.0%)
- got a job (39.7%)
- a promotion (or increased status at work) (27.3%).

The vast majority (99.5%) also considered their training either highly relevant or somewhat relevant to their current job after training.

Student outcomes

Employment during training

- 98% of electrotechnology and telecommunications apprentices were supported during their studies through paid work, including existing apprenticeship arrangements. Other sources of income during training included government benefits such as Youth Allowance and financial support from family sources (SOS 2004).
- All electrical and communications apprenticeship graduates who had a job during the six months before commencing training were employed as wage or salary earners, compared with those graduating in UTE and ITE Training Packages which did not form part of an apprenticeship, where there was a higher rate of self-employment and business ownership.
- Of those students enrolled in apprenticeships and traineeships who did *not* complete all requirements for their training, a significant proportion (10.8%) were conducting their own business—including employing staff—in the six months before training.

Employment outcomes

Of all students who had completed electrotechnology and telecommunications apprenticeships, 94.4% were either employed or in further study at the time the survey was conducted (SOS 2004).

Those employed after completing their training accounted for 93.4% of all apprenticeship completions, with:

- 97.2% of employed apprentices working as wage or salary earners
- a small number (2.8%) self-employed (conducting their own business without employees)
- 91.9% employed on a permanent basis, with only 5.3% employed casually
- 32.5% enrolled in further study.

[8] Multiple choice question.

Further study

Of those undertaking further study, 92.6% were enrolled at a TAFE institute, with 1.6% enrolled in a TAFE division of a university. Only 4.2% of further study was undertaken through a private provider. This indicates that the bulk of private provider training delivered to the industry (e.g. vendor training) is not taken up by new entrants—those who recently completed an apprenticeship qualification—but by existing workers within the industry.

In relation to further study, 30.8% was pursued at the AQF certificate IV (or advanced certificate/ technician) level, with 18.5% of enrolments at certificate III level and 26.1% of students undertaking other (non-specified) certificates.

Nearly a quarter of the students surveyed who were undertaking post-apprenticeship study were pursuing further training at lower-than-expected levels, with 21.1% enrolled in stand-alone modules (gaining a statement of attainment), and 3.5% enrolled at the certificate I level.

With the majority of UTE apprenticeships at the certificate III level, and (technical) ICT in certificate II qualifications; this demonstrates that not all further study was necessarily undertaken to gain higher qualifications, with graduates from apprenticeship programs pursuing non-award and unaccredited study, as well as lower-level qualifications. The survey data are limited in determining the subject area of such study (and whether it was undertaken for job-related or personal reasons), but it is nonetheless worth noting that over half of all graduate apprentices pursuing further study were doing so at an unspecified—or lower—skill level in the public VET system.

This suggests that new entrants to the electro-communications industry are supplementing their initial trade qualifications with an assortment of single subjects and other certificates to meet their ongoing skill needs upon obtaining employment in the industry. It also reflects the number of new entrants pursuing single and non-award subjects from within the UTE and ICT Training Packages in order to satisfy regulatory requirements and licensing stipulations within the industry.

While TAFE training is successfully providing new entrants with the requisite base skills for industry (see 'Employment outcomes' and 'Satisfaction with New Apprenticeships'), this does not preclude workers from pursuing post-trade training in new areas (e.g. telecommunications, OH&S) to complement their initial trade qualification. While vendor training plays a more significant role for established workers in the industry, new entrants tend to supplement their skills with other courses and modules offered through the public VET system.

Satisfaction with New Apprenticeships

The vast majority (88.5%) of the electrotechnology and telecommunications apprentices surveyed indicated that they were satisfied with the quality of their training, with very few (1.2%) dissatisfied. (The remainder of respondents were uncommitted.)

Most (88.3%) of the apprentices surveyed also agreed that they had gained the skills they wanted to learn from their training, with 4.2% (or 66 individuals) disagreeing, and 7.5% uncommitted (neither agreeing nor disagreeing).

Finally, an overwhelming 96% of apprentices acknowledged that they would recommend the training they had received to others (SOS 2004).

School-based New Apprenticeships

There were very few apprentices and trainees undertaking school-based New Apprenticeships, with 1.7% of ICT telecommunications and 0.4% of UTE electrotechnology industry apprenticeships school-based in 2004. (There were no school-based New Apprenticeships among UTL Lifts Industry commencements). This is consistent with the interviews conducted with contractors for Stage 2 of this project, in which occupational, health and safety issues were identified as a key obstacle to the delivery of school-based training.

Across the range of Electro-communications Training Packages, however, there were specific qualifications with a greater proportion of school-based enrolments, as Table 23 indicates.

Table 23: Highest proportion of school-based New Apprenticeships, commencements 12 months to December 2004 for selected training packages, Australia

Training package qualification	Number school-based	% school-based	Total commence-ments
UTE20299 – Certificate II in Electrotechnology Data Communications	2	18.2	11
UTE20599 – Certificate II in Electrotechnology Servicing (superseded by UTE20502)	8	10.0	80
ICT20202 – Certificate II in Telecommunications	3	3.8	78

Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

There were also 20 school-based commencements in the Certificate III in Electrotechnology Systems Electrician (UTE31199), but with apprenticeship numbers exceeding 6,060 in this qualification, these accounted for only 0.3% of total commencements.

Training undertaken through non-apprentice pathways

Non-apprenticeship training within the electrical and communications industry has shown considerable growth in recent years, with a range of delivery methods and provider options available to both existing workers within the industry, and new or aspiring entrants into electro-communications fields.

Training avenues available to the electrical and communications industry include:

- ✧ apprenticeships (captured in the previous section of this report)
- ✧ other VET (non-apprenticeship) study, including:
  - ♦ full qualifications (e.g. certificate III, diploma), including those offered under industry training packages
  - ♦ single, or stand-alone subjects ('modules') delivered by TAFE and other registered training organisations, which form part of a non-completed qualification, or—in some jurisdictions—are available as single-subject enrolments
- ✧ training delivered by private providers (such as vendors), including:
  - ♦ unaccredited training which does not form part of a nationally recognised qualification through the VET system, but which is recognised within industry as satisfying licensing or equipment installation requirements
  - ♦ other forms of unaccredited training, including short courses, various forms of non-award study and workshops.

In Stage 2 of this report, respondents confirmed that the industry seems to have made a big shift towards short course training in recent years, with a considerable proportion of the existing industry workforce engaging in vendor training. With a diverse array of providers, however, and no universal reporting mechanism, there are considerable difficulties in comparing data obtained from the publicly funded VET system with that provided by other RTOs, private providers, vendors and other suppliers of training.

Non-apprenticeship vocational education and training

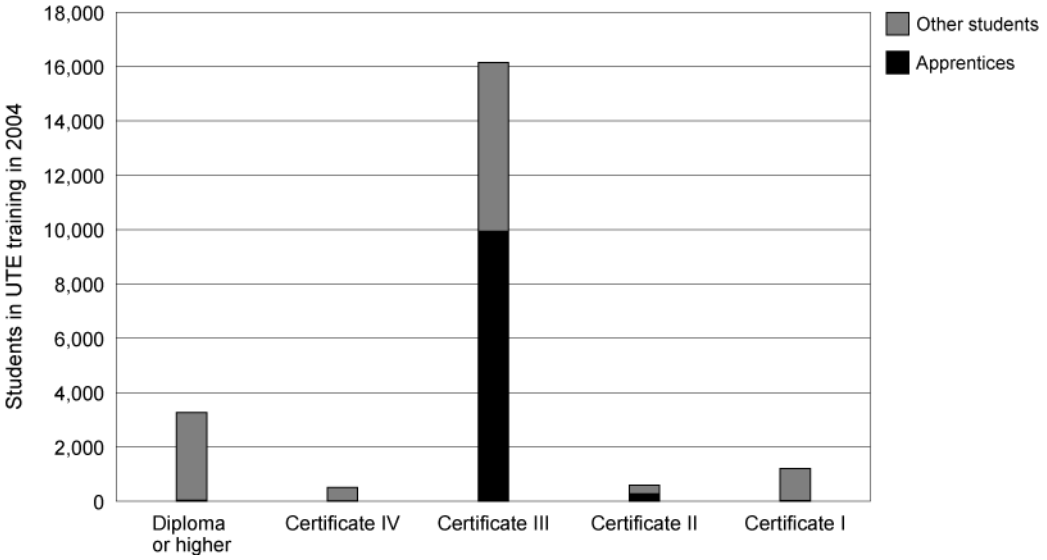
Commencements in non-apprenticeship VET courses exceeded those for apprenticeships, with 14,533 vocational course enrolments (in-training) in identified Electrotechnology (UTE), Telecommunications (ICT) and Lifts Industry (UTL) Training Packages in 2004, compared with 8,002 commencements in apprenticeship-specific training in the 12 months to December 2004.

Overall, there were 25,911 enrolments in the selected training packages in the VET data collection, in which there was considerable overlap between apprenticeship and non-apprenticeship training. To enable a more useful comparison of student populations, TAFE enrolments recorded as forming part of an apprenticeship or traineeship—which were captured in the previous section of this report—have been excluded from data analysis for 'other VET' activity.[9]

Level of qualification

As a picture of overall training effort in the public VET system, students undertaking other electrical and communications qualifications tended to be enrolled in a broader spread of award levels, including both higher (e.g. advanced diploma) and lower (e.g. certificate I) levels under the Australian Qualifications Framework.

Figure 23: Apprentice and trainee commencements and total vocational course enrolments (in-training) 12 months to December 2004, by AQF level



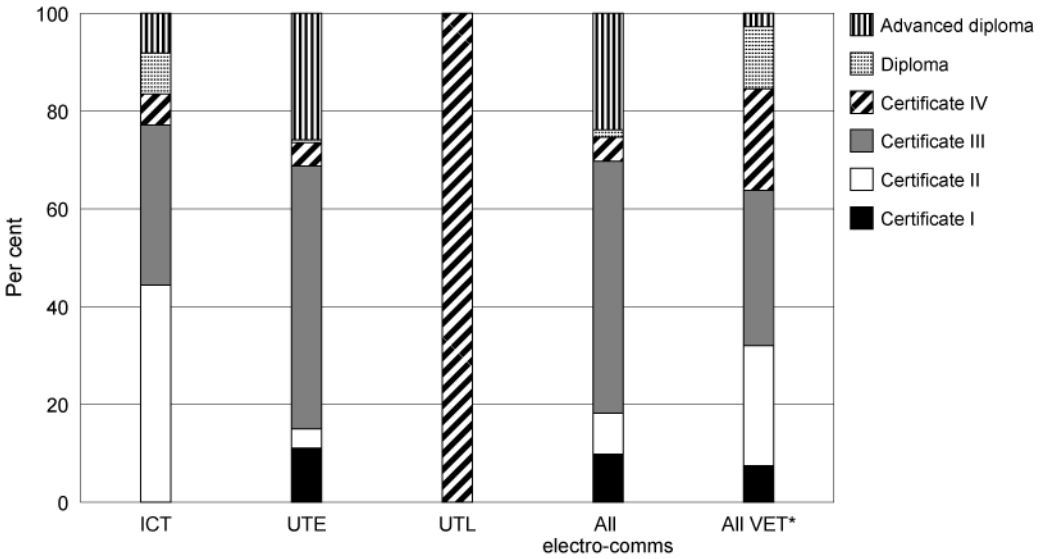
Source: NCVER, unpublished statistics

As Figure 23 demonstrates, a considerably larger proportion of non-apprenticeship enrolments in Electrotechnology and Telecommunications Training Packages were in higher-level VET qualifications, compared with vocational commencements generally.

While enrolments in certificate I level qualifications were slightly higher than the average under the UTE Training Package (see Figure 24), there were no commencements in qualifications below certificate II for the ICT (Telecommunications) package. As with apprenticeships, the majority of training in electrotechnology was at the certificate III level, but with a substantial number of enrolments in advanced technical qualifications, particularly at the advanced diploma level. Nearly ten times the proportion of VET commencements in UTE qualifications were at the advanced diploma level at 25.9%, compared with average VET commencements at only 2.7%.

[9] Due to the existing structure of the VET data collection, there may be a small number of apprenticeships included in numbers for other VET enrolments. This can occur when apprentices and trainees undertake off-the-job training, which includes enrolment at a TAFE institute, but where apprenticeship status has not been recorded by providers at the time of commencement. Where data from the Student Outcomes Survey were used, student populations were able to be more easily differentiated due to the information collected being self-reported (i.e. as a survey response). Subsequently there is no risk of overlap between apprentices and non-apprentices in the SOS data analysis.

Figure 24: Non-apprenticeship vocational course enrolments (in-training) in selected training packages for Australia, 2004, by AQF level



Note: *All VET activity, excluding those enrolments with an apprenticeship or traineeship data flag. Based on June 2005 estimates.

Source: NCVER, unpublished statistics

Time series

With apprenticeship status only able to be recorded in the general VET data collection since 2003, it is useful to provide an overall account of TAFE enrolments over time (see Table 24), as well as training specific to non-apprentices, which is only able to be reported for 2003 and 2004.

The most popular UTE courses in overall VET commencements (*not* excluding apprentices) are shown in Table 24.

Table 24: Highest number of VET course enrolments (in-training) in UTE Electrotechnology Training Package qualifications, 1999–2004, Australia

Training package qualification	1999	2000	2001	2002	2003	2004
UTE31199 Certificate III in Electro-technology Systems Electrician	41	1,960	4,280	7,090	10,689	14,218
UTE60199 Advanced Diploma of Computer Systems Engineering	0	0	60	2,072	2,279	2,128
UTE30999 Certificate III in Electro-technology Refrigeration & Air Conditioning	0	555	1,032	1,440	1,736	2,041
UTE60399 Advanced Diploma of Electronics Engineering	0	0	37	574	1,029	1,092
UTE10102 Certificate I in Electro-technology (including UTE10199 [superseded by UTE10102])	0	61	215	515	651	1567

Note: Based on June 2005 estimates.

Source: NCVER, unpublished statistics

Of entirely non-apprenticeship enrolments, a different pattern emerges, with the highest volume of training activity undertaken in advanced qualifications, particularly at the certificate IV and advanced diploma levels (Table 25).

Table 25: Highest number of non-apprenticeship VET course enrolments (in-training) in UTE Electrotechnology Training Package qualifications, 1999–2004, Australia

Training package qualification	2003	2004
UTE60199 Advanced Diploma of Computer Systems Engineering	2,272	2,119
UTE60399 Advanced Diploma of Electronics Engineering	1,017	1,080
UTE40599 Certificate IV in Electro-technology Contracting	168	258
UTE60299 Advanced Diploma of Electrical Engineering	30	137
UTE41202 Certificate IV in Electro-technology Systems Electrician	0	113
UTE40499 Certificate IV in Electro-technology Computer Systems	15	86
UTE41301 Certificate IV in Electro-technology Renewable Energy	0	70

Source: NCVER, unpublished statistics

The most numerous ICT enrolments for general VET courses (*not* excluding apprentices) are shown in Table 26.

Table 26: Highest number of VET course enrolments (in-training) in ICT Telecommunications Training Package qualifications, 1999–2004, Australia

Training package qualification	1999	2000	2001	2002	2003	2004
ICT20302 Certificate II in Telecommunications Cabling (including ICT20297 [superseded by ICT20302])	162	419	721	608	840	507
ICT20202 Certificate II in Telecommunications (including ICT20197 [superseded by ICT20202])	64	36	290	373	387	442
ICT30202 Certificate III in Telecommunications (including ICT30197 [superseded by ICT30202])	0	96	104	507	642	301
ICT30497 Certificate III in Telecommunications (Cabling)	45	171	287	411	314	200

Source: NCVER, unpublished statistics

With all apprenticeship elements excluded from enrolments, the enrolment pattern remains largely the same for ICT, demonstrating the drop in commencements in ICT20302 between 2003 and 2004 (although it remains the most popular qualification in terms of overall training numbers).

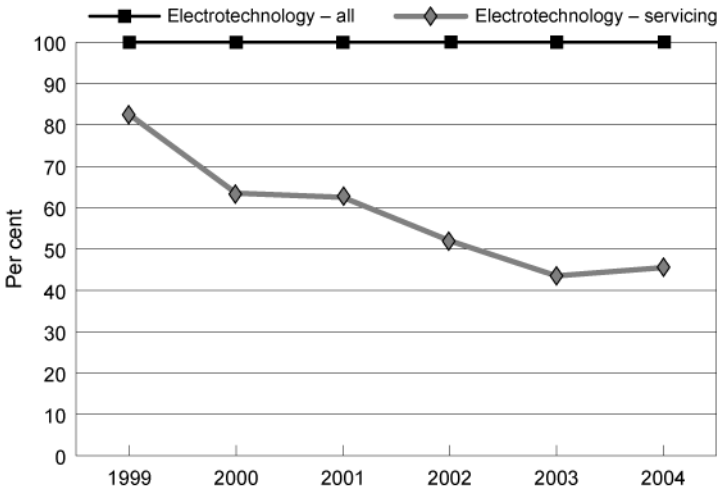
Table 27: Highest number of non-apprenticeship VET course enrolments (in-training) in ICT Telecommunications Training Package qualifications, 1999–2004, Australia

Training package qualification	2003	2004
ICT20302 Certificate II in Telecommunications Cabling (including ICT20297 [superseded by ICT20302])	796	381
ICT30202 Certificate III in Telecommunications (including ICT30197 [superseded by ICT30202])	628	282
ICT30497 Certificate III in Telecommunications (Cabling)	294	192

Source: NCVER, unpublished statistics

As with apprenticeships and traineeships, enrolment in electrotechnology servicing qualifications has diminished in recent years when compared with enrolment trends across all Electrotechnology (UTE) Training Package qualifications. This supports the findings from the Stage 2 interviews, which found that contractors were experiencing difficulties in locating qualified workers for servicing roles in the industry.

Figure 25: Vocational course enrolments (in-training) in electrotechnology servicing qualifications, Australia 1999–2004



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics

Student characteristics

Students enrolled in a UTE or ICT Training Package which didn't form part of an apprenticeship or traineeship tended to be older than those undertaking apprenticeship training. The average age of student enrolments in non-apprenticeship electrotechnology courses was 24 years, compared with 20.4 for those doing apprenticeships. The age profile of telecommunications students was considerably wider, with a gap of over ten years between telecommunication apprentices (at an average age of 19.7 years) and non-apprentices, at 32 years.

An age comparison for enrolments in the lifts industry (UTL) was not able to be obtained due to the low number of apprenticeship commencements in electrical-based qualifications under this training package. (The number of other VET enrolments was also minimal.)

New entrants and existing workers

The difference in the age profile between apprenticeship and non-apprenticeship (other VET) students indicates that there are two main training pathways catering to different student populations and training needs, with a third in the form of existing workers undertaking higher-level specialist qualifications. Apprenticeships essentially serve as the initial trade qualification for new entrants, with other (non-apprenticeship) VET pathways enabling continuing or post-trade learning, or facilitating a change in career. This is supported by information collected from the 2004 Student Outcomes Survey, which found:

- ✧ nearly 60% of graduates in other (non-apprenticeship) VET electrotechnology and telecommunications qualifications had started their training more than 12 months after leaving school, compared with 39.6% of apprentices
- ✧ less than 23% of graduates other VET courses indicated that their current job was their first full-time job after training, compared with the majority (54.4%) of apprentices
- ✧ non-completing VET students (those who did not gain the full qualification in which they enrolled) had an even higher proportion of students starting training later, with 77% having left school more than a year before starting training.

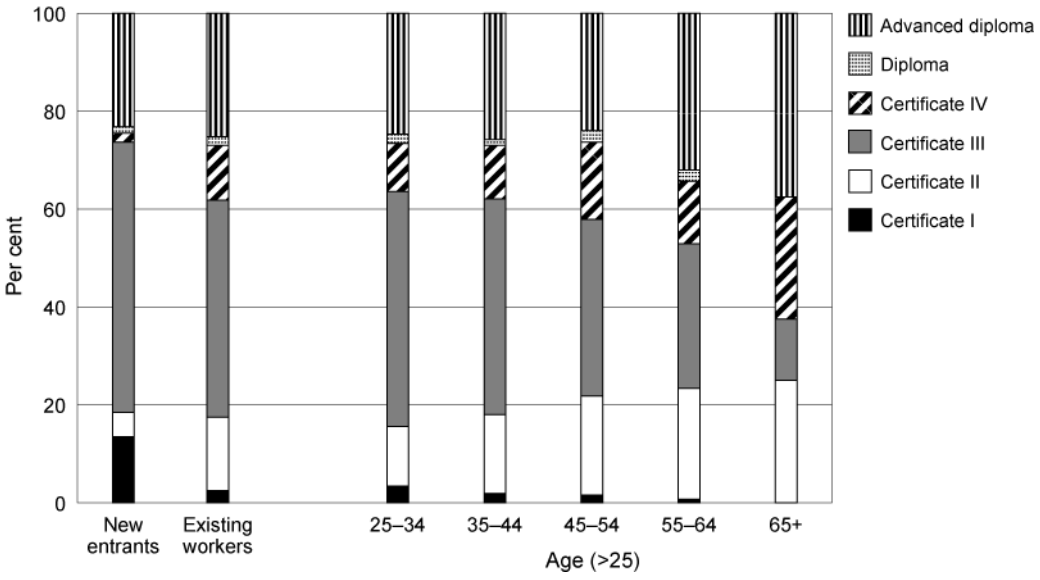
Graduates in non-apprenticeship VET courses also tended to be more established in the workforce, with:

- ✧ 61% employed on a permanent and ongoing basis before training, compared with 39% of apprentices

- 14.4% either self-employed or employing staff, with a negligible rate for apprentices
- fewer new entrants and more existing workers, with nearly two-thirds employed with the same employer before and after training, compared with under a third for apprentices
- fewer VET graduates reporting a change in occupation (30%) or industry (32%) after training, compared with 51% and 62% for apprentices, respectively
- a higher proportion of students undertaking training for reasons of further study or personal development (28%), compared with apprentices, for whom employment-related reasons accounted for some 97% of responses.

As shown in the comparison of new entrants and existing workers (Figure 26), the proportion of electrical and communications workers undertaking advanced qualifications was fairly even, but with more new entrants undertaking lower-level courses (certificate III and below) than existing workers, at 73.7% compared with 61.9%, respectively.

Figure 26: Non-apprenticeship vocational course enrolments (in-training) in selected training packages for Australia, 2004, by existing worker (>25 years) and new entrant (<25 years) status



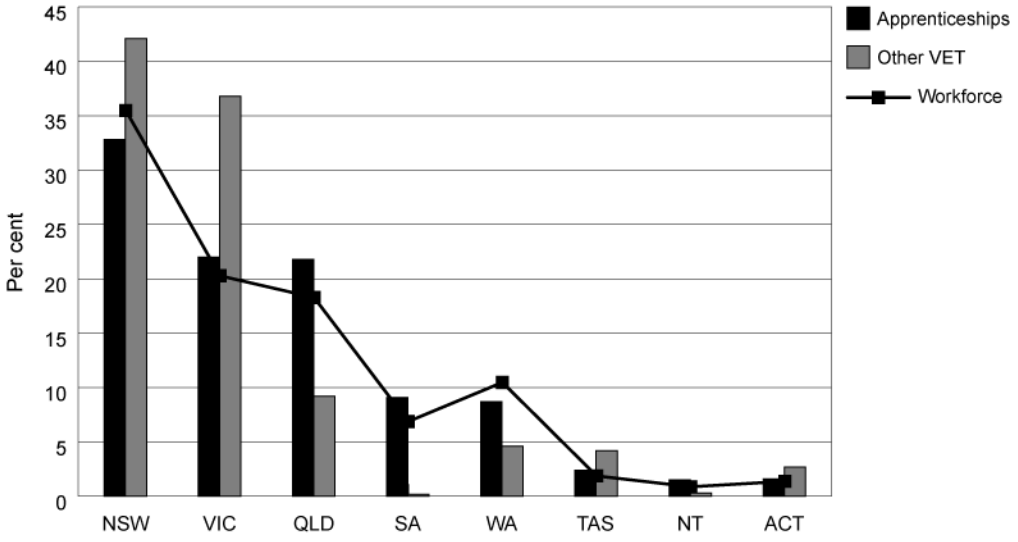
Source: NCVER, unpublished statistics

Equivalent proportions of new entrants and existing workers were enrolled in the advanced diploma, but with a higher proportion of existing workers undertaking other higher-level qualifications, such as at the certificate IV and diploma level.

Location

An update of Figure 18 is represented in Figure 27, in which the percentage of training activity across states and territories is contrasted with their respective share of employment capacity in the electrical and communications industry across Australia.

Figure 27: Non-apprenticeship vocational course enrolments (in-training) and apprentice and trainee commencements 12 months to December 2004 by selected training package qualifications, by state; and employment in electrical and communications industry, by state, August 2001



Note: Based on June 2005 estimates.
Source: NCVER, unpublished statistics; ABS Census of Population and Housing, 2001

As Figure 27 demonstrates, trends in training delivery vary considerably between jurisdictions, with South Australia having a low proportion of other VET training, but meeting the industry's skill needs primarily through apprenticeships.

The difference between training activity in apprenticeships and other VET is most considerable in the case of Victoria, where the 'gap' between apprenticeship and non-apprenticeship VET courses is the highest in Australia (exceeding that of New South Wales), but where the proportion of apprenticeships is equivalent to that of Queensland. Smaller states and territories (including Tasmania and the Australian Capital Territory) also tended to have a higher volume of other VET training compared with apprenticeships.

In all states and territories with the exception of Western Australia, the overall volume of training was sufficient to meet the market share of the industry in that state, regardless of whether the jurisdiction favoured apprenticeships or other VET to meet the needs of the industry. In Western Australia, the proportion of workers in the electrical and communications industry outstripped the supply of vocational training, with a clear gap existing between the demand for workers and the supply of skills.

As with Figure 18, however, it is important to acknowledge the time lapse between the workforce analysis (2001 Census) and apprenticeship data collection (12 months to December 2004, based on June 2005 estimates). In the four or more years since the publication of Census data, the number of workers in the electro-communications industry may have changed—particularly with the spike in demand for electrical workers during the Olympic period in New South Wales, and fluctuations in the construction industry across states and territories. A more accurate gauge of how training is responding to each state's share of the overall industry across Australia would be yielded by reproducing the statistics in Figure 18 upon the release of the 2006 Census, taken as a comparison against NCVER data collections for September 2006 (data available: March 2007). This would produce a closer and more up-to-date approximation of training and employment activity across Australia, with only a small time gap separately the ABS and NCVER sourcing of data.

Reasons for training

Students expressed different reasons for enrolling in other VET study, compared with apprentices, with a significant number (22.5%) stating that they were undertaking training for interest or personal reasons, and very few (1.5%) undertaking training because it was a requirement of their job, compared with 58.5% of apprentices.

Table 28: Main reason for undertaking training, Electrotechnology (UTE) and Telecommunications (ICT) other VET enrolments, 2004 Student Outcomes Survey (2003 graduate cohort)

Main reason for undertaking training	Other VET			
	Graduates		Module completers	
	Count	*%*	*Count*	*%*
To get a job	312	39.2	196	28.5
To develop my existing business	0	0.0	81	11.7
To start my own business	20	2.5	12	1.7
To try for a different career	66	8.3	76	11.0
To get a better job or promotion	69	8.7	121	17.6
It was a requirement of my job	12	1.5	13	1.9
I wanted extra skills for my job	97	12.2	36	5.2
To get into another course of study	34	4.2	0	0.0
For interest or personal reasons	179	22.5	153	22.3
Other reasons	8	1.0	0	0.0
Total	**796**	**100.0**	**688**	**100.0**

Source: NCVER Student Outcomes Survey, 2004

The most common response from students undertaking non-apprenticeship VET training was that they wanted to get a job, despite most VET students already having a job before they commenced training (79.6% of VET students reported that they did not actively look for work during the six months before training). To some extent, this reflects the high job turnover within electro-communications sectors (see 'Tenure', including Figure 8).

Future study

- Irrespective of whether enrolled in apprenticeship or non-apprenticeship VET courses, approximately 25% of students who had successfully completed their qualifications were currently enrolled in other TAFE training at the time the survey was conducted. This training activity was generally confined to those enrolled in UTE Training Package qualifications, with only approximately 2% of students enrolled in telecommunication packages undertaking additional TAFE training (SOS, 2004).
- By contrast, graduates in non-apprenticeship qualifications were slightly less active in pursuing further study, at a rate of 22.8%. However, students undertaking further study tended to enrol in higher-level qualifications, with 42.2% at the diploma level or higher, including 6.2% of further study occurring at the tertiary (university) level.

Unaccredited vocational education and training

As with training delivered through private providers, reporting on unaccredited vocational education and training is problematic due to imprecise reporting procedures (e.g. where a student may enrol in more than one course across multiple institutions) and the limitations of current data collections for single-subject enrolments (modules). In some jurisdictions, students are required to enrol in a full qualification (e.g. certificate II) rather than single subjects, even when students may only intend to complete one or two modules to meet their specific skills needs.

This requires that caution be used in treating unaccredited study/module-only completions as 'incomplete' qualifications or a case of student 'drop out'. While some attribution is to be expected in overall course enrolments, the fact that nearly a quarter of module completers gave skill-related reasons as their reason for discontinuing study (e.g. 'I learnt the skills I needed for my job', 'I achieved my training goals') reflects that students are selectively choosing modules to meet their skill needs.

Table 29: Main reason discontinued training, Electrotechnology (UTE) and Telecommunications (ICT) non-apprenticeship VET enrolments, 2004 Student Outcomes Survey (2003 graduate cohort)

Main reason discontinued training	Other VET – module completers	
	Count	%
Changed jobs or started a new job	51	9.3
I learnt the skills I needed for my job	42	7.6
I achieved my training goals	49	9.0
I started other training	0	0.0
The training no longer related to my plans	42	7.7
The training was not what I expected	93	17.0
The training timetable was not flexible enough	65	11.8
I moved	42	7.6
Illness	86	15.7
Financial reasons	0	0.0
Too many pressures on my time	63	11.4
Any other major reason	17	3.0
Total	**549**	**100.0**

Source: NCVER Student Outcomes Survey, 2004

That 77.5% of all module completers were employed in the same industry before and after training (an even higher rate than those students enrolled in full qualifications, at 67.9%) also suggests that existing workers are even more likely than new entrants to supplement their initial trade qualifications with single subjects and lower-level certificates (e.g. statement of attainment, certificate of competency or proficiency).

Vendor training

Information on the volume of vendor training delivered to the electrical and communications industry was difficult to obtain, due to the lack of a consistent reporting mechanism for non-publicly funded training. While vendor organisations have varying degrees of information available on the training they deliver both internally and externally, it was not possible to source reliable data on the number, type and existing employment roles of persons undertaking vendor training Australia-wide. Consequently, selective sampling was used to obtain data from vendors.

Two national vendor organisations were interviewed for this report, including a leading supplier of electrical systems and a telecommunications vendor. Differences in course content, mode of delivery and accreditation status (including the degree of integration with existing VET training) were considerable between the two suppliers, which highlights the difficulties in making any quantitative comparisons between vendors, let alone between publicly funded and privately provided sources of training.

While the resulting data analysis cannot be taken as representative of overall training activity, it does illustrate the key role played by vendors in the delivery of training to industry. Data obtained for comparative purposes included: student characteristics, career stage, occupation and reasons for undertaking training through a vendor rather than the publicly funded VET system.

Example 1: Electrical systems vendor training

A precise number of students training per annum could not be established from this vendor, although it was estimated at approximately 2000 students across some 300 courses. Specialised, product-specific training in smart wiring accounted for approximately half of this training; with rising levels of participation in both product-specific and non-product-specific training.

Courses tended to be delivered predominantly to existing and established workers within the industry who were:

- ✧ almost exclusively male
- ✧ aged between 30 and 50
- ✧ contractors/owners of businesses
- ✧ employed in domestic, commercial and (some) industrial construction.

An age breakdown and more detailed information on the workers undertaking training were not available, as student characteristics are not considered by the organisation as relevant to training delivery, given that courses are trade-specific and targeted mostly at the people who use the supplier's product, either directly or indirectly (such as project managers). Vendor training was typically undertaken by employers, site/project managers and contractors/owners who tended to pass knowledge gained on to apprentices and other employees.

Training participants are predominantly employed in electrical trades occupations, work in electrical and data fields and are employed in all states and territories across Australia.

An example of the three most common courses provided by this vendor is listed below.

Table 30: Training courses offered by sampled electrical vendor

	Course 1	Course 2	Course 3
Type of product or service the training covers	Integrated Systems Basic Building Automation Products	Various Types of Higher end Integrated Systems Building Automation Products (Touch Screens)	Highest end Integrated Systems Basic Building Automation Products (High-level Language Programming Techniques)
Is the training accredited? (if so, please identify qualification it leads to)	No	No	No
Trainer details: (*company position; industry qualifications; training qualification?*)	Technical Support Officers (Certificate IV in Training)	Technical Support Officers (Certificate IV in Training)	Technical Support Officers (Certificate IV in Training)
Mode of course delivery (venue, training arrangement, length of course in hours)	Training held in-house in each state and territory 2.5 days	Training held in-house in each state and territory 2 days	Training held in-house in each state and territory 2 days
Number of commencements and completions per year	Approx 1000	Approx 500	Just started (should be same as Intermediate 1)
Student age breakdown (<25 years; 25–44 years; >44 years)	All ages	All ages	All ages
Typical occupations of students	Engineers and electricians mostly	Engineers and electricians mostly	Engineers and electricians mostly
States & territories in which course conducted	All states and territories	All states and territories	All states and territories

Source: Vendor interview, NCVER, 2005

Example 2: Telecommunications vendor training

By comparison with the training offered by the supplier of electrical systems, the courses delivered by the telecommunications vendor tended to be much more closely integrated with publicly funded vocational education and training. The courses provided by the electrical systems vendor tended to be industry-recognised and/or equipment-specific but generally operated outside the public VET system (i.e. satisfying equipment installation licensing requirements and industry-established systems accreditations, but not forming part of a recognised qualification under the Australian Qualification Framework). By contrast, training provided by the telecommunications vendor included courses accredited under national training competencies, which also contribute to nationally recognised qualifications, as well as meeting Australian (and in some cases, international) industry standards.

Table 31: Training courses offered by sampled telecommunications vendor

Topic	Course 1	Course 2	Course 3
Type of product or service the training covers	Structured cabling with category 5 and category 6 endorsements	Designing telecommunications installations for buildings	Optical fibre installation and termination techniques
Is the training accredited? (if so, please identify qualification it leads to)	No examination of participants, but trains students to the level required for ISO 11801. Also contributes to Certificate III in Telecommunications Accredited to NTC 019 national training competency and ICTTC 009C	Qualifications are ICTTC 002B. Contributes towards Certificate IV in Telecommunications	Accreditation is NTC 021, also ICTTC 010B This course contributes to Certificate III in Telecommunications
Trainer details: (company position; industry qualifications; training qualification?)	Training company used, as well as qualified trainers in-house		
Mode of course delivery (venue, training arrangement, length of course in hours)	Almost all classroom-based training. Have their own training facilities, but also tend to use TAFE facilities. Training based predominantly in capital cities.		
Length of course	24 hours (3 days by 8 hours)—with proposal to reduce to 2 days to reduce the cost to employers	16 hours (2 days by 8 hours)	24 hours (3 days by 8 hours).
Number of commencements and completions per year	200 students/year (Feb.–Nov.) over 20 courses. Drop-out rate would be extremely low—mainly due to accidents, etc.)	100 students/year. Approximately 10% drop-out rate, primarily due to failure to hand in assigned project work (students expected to prepare and submit a design proposal). Completion rate approx. 90%	100 students/year. Drop-out rate virtually zero.
Student age breakdown (<25 years; 25–44 years; >44 years)	Age Number <25 150 25–44 45 >44 5	Age Number <25 35 25–44 60 >44 5 About 'half a generation' older than the Master installer course, as it is at a higher level and is done by people with more experience in the industry (often by estimators or business owners)	Age Number <25 50 25–44 45 >44 5
Typical occupations of students	Approx. 80% are employees of data installation companies, with an equal split between electrical and non-electrical companies. Only one-third would be electricians, with the majority of two-thirds employed in data-communication occupations Remaining 20% of the students self-employed (e.g. run their own small business)		
States & territories in which course conducted	All capital cities. Also provides training in some major regional centres		

Source: Vendor interview, NCVER, 2005

Key findings from statistical analysis

The quantitative analysis found that:

- ✧ apprentices in electrical and communications fields are young and overwhelming male
- ✧ the industry has a highly skilled workforce, with a higher proportion of post-school qualifications than the general working population
- ✧ while retention in electrical and communications occupations is longer than in Australian industry generally, there is higher job turnover rate after 5–10 years
- ✧ apprenticeships serve as the core training for the industry, with other VET training serving a complementary role (e.g. training existing workers in electrical trades in telecommunications areas, facilitating a change in career, up-skilling etc.)
- ✧ short courses and vendor training cater more to established workers (e.g. project managers, business owners) who transfer the knowledge to apprentices and other employees.

Suggested directions for future research

Suggested directions for future NECA research include:

- ✧ updating electrotechnology workforce data analysis upon the release of the 2006 ABS Census of Population and Housing, to determine growth of electrical and communications industry over the past five years
- ✧ creating time series analyses of industry labour force using 2006 Census data, modelled against the 2001, 1996, 1991 and 1986 Censuses (using comparable occupation and industry specifications), to generate more precise measures of employment over time
- ✧ revising previous occupational analysis and integrating new classification categories from the upcoming ANZSCO (due for release in July 2006), for alignment with the 2006 Census
- ✧ accessing results from the Survey of Employer Use and Views of the VET System (due for publication in February 2006), to yield qualitative and quantitative information on skills needs and employer engagement with vocational education and training, and use of other training options.

Other investigations into training provision may include (periodically):

- ✧ examining apprenticeship numbers and other VET enrolments in electrotechnology servicing qualifications
- ✧ monitoring courses with low-volume training activity, in conjunction with industry needs
- ✧ observing apprenticeship commencements in lifts industry (UTL) qualifications
- ✧ keeping abreast of developments in the reporting and collection of non-VET training, including delivery by vendors and other private providers, as well as other avenues of unaccredited and/or non-award training.

Finally, due to the need to obtain information on the training choices of workers within the industry (rather than the characteristics and outcomes of specific student populations), a survey approach may yield more useful data than conducting further research using existing sources. With a clearly defined membership and the participation of willing organisations, NECA could consider conducting a small survey with individuals employed within the industry to determine the training pathways, preferences and skill needs of workers across selected electrotechnology occupations.

Interviews with contractors, vendors and training providers

Methodology

Based upon the revised proposal: *Analysis of the electrical and communications industry workforce*, submitted to the National Electrical and Communications Association (NECA) by NCVER, a set of draft questions was developed. These questions were forwarded to NECA for approval to form the basis of the contractor interviews. A series of interviews were conducted with a sample of contractor companies, training providers and vendors, selected from a list provided by NECA, in the electrotechnology industry across Australia. The consultations covered:

- ✧ To what extent do contractors recognise there is a skills shortage? What skills are in shortest supply? What business strategies are being put in place by contractors to ensure an adequate supply of skilled labour for the future?
- ✧ What is the current state of training by contractors? How much do they spend? Who do they feel should have the responsibility for training and meeting its cost? What are the barriers to training?
- ✧ What are the impacts of technological change on the industry?
- ✧ How are contractors planning for emerging technologies and the desire of industry entrants for career progression? What does this mean for investing in new skills?
- ✧ What are the key 'drivers' of training for contractors? Is it new technology, gaining product knowledge, licensing, compliance, safety considerations or a combination of factors?
- ✧ What are the reasons that contractors are unwilling to undertake further re-skilling? What are the 'triggers' that could get them to undertake further re-skilling?

In all, 21 interviews were conducted with contracting companies: five in New South Wales, six in Victoria, two in Tasmania, four in South Australia, two in Western Australia and two in the Australian Capital Territory. Eight of the companies were primarily engaged in electrical work, six in communications work, three in industrial work, and four in a combination of domestic and commercial work. These are summarised in Table 33.

Table 32: Summary of contractors interviewed by state/territory and category of work performed

State/territory	Category of work performed				
	Electrical	Communications	Industrial	Domestic & small commercial	**Total**
NSW	1	3		1	**5**
VIC	4	1		1	**6**
TAS			1	1	**2**
SA	2	1		1	**4**
WA	1		1		**2**
ACT		1	1		**2**
Total	**8**	**6**	**3**	**4**	**21**

Each of the contractors was first contacted by telephone and invited to participate. Following this initial telephone contact the respondent was forwarded by email a letter from NECA outlining the purpose of the project, together with a one-page list of the topics the interviewers proposed to cover. See appendices C and D respectively for the letter of invitation and interview questions. Upon receipt of this information, if an interview had not already been scheduled, this was done through a further telephone call. Two pilot interviews were conducted, one face to face, the other by telephone to check the questions used and to gauge how long a typical interview would take. No refinement of the questions was necessary. The pilot interviews were about one hour in length; however, in practice it was found they could be completed in about 30 to 45 minutes.

In addition to interviews with contractors, in-depth interviews were also conducted with two major training providers—one TAFE and one private, and two vendors—one primarily engaged in developing, manufacturing and marketing in the electrical field, and the other in the data-communications field, giving a total of 25 in-depth interviews with contractors, vendors and training providers.

As well as identifying and describing the issues of concern, this section of the report also includes a large number of selected comments. These comments are intended to help convey the tone and intensity of the respondents' feelings on the matters canvassed.

Interview findings

Impact of technological change on industry

Technological change, both in electrical and data-communication sectors, is having a considerable impact on contractors in the electrotechnology industry. Automation (which incorporates computer systems into the management of equipment), the development of *smart* wiring systems, the use of wireless and infrared technology, new approaches in lighting control, and energy conservation were identified by contractors and training providers as just some examples of new developments that were changing the way in which the industry trained and worked.

> If you look at the domestic home, you've got a centralised computer system in them now—and security systems. The technician working on them needs to be aware of how they are installed, how they operate, how you program them, and how you troubleshoot them.
>
> TAFE training provider

As several respondents pointed out, this is leading to a merging of technologies. Whereas in the past, an electrician would simply install switches, cables, lights and power points, nowadays these components often have to form part of an integrated system and the installer needs to run the non-power communications wiring in with the conventional power components and then connect and configure the entire system. The new skills needed are quite different from those of the traditional electrician.

> Whereas in the past they simply installed switches, cables, lights and power points to plug appliances into, now they have to think how to put system components together, and to run the non-power communications wiring into it and then set it up to make it work. So that is a different set of skills we are looking at, quite different from what the traditional electrician uses.
>
> TAFE training provider

> The technology is becoming more complex, the black boxes are becoming smaller, and more is being achieved over one cable than used to be before. Whereas, ten years ago you would have to run separate cabling systems, a lot of these things are now running down the one line or one group of cables.
>
> Contractor

Strategies to meet these new demands can include multi-skilling existing employees or the development of two levels of installer, one who simply puts the wiring and components in place

and makes the basic connections and a higher-level installer who is able to design an installation, install the equipment and configure it.

A contractor also saw value in increasing the numbers of tradesman's assistants.

> There is a need is for what we call a tradesman's assistant, a person who has skills in doing things like installation of cable trays, pulling in of large cables and roughing in. There are not enough of these types of people. We need to get it right—this is where we can gain some ground by having these sorts of people. Contractor

There has also been a shift to a *throw-away* approach. As one of the training providers pointed out, because their workers do not have the high levels of technological knowledge and skills needed to diagnose faults and repair them, companies are resorting to replacing components rather than repairing them. This is treating components as *black boxes* with specified inputs and outputs so that, if a problem arises, rather than attempt to diagnose and repair the problem within the black box, the black box is simply replaced.

The vendors spoke of new systems and products which require greater knowledge and skill to be exercised in their installation in order for them to be able to work properly (a simple example being the separation and shielding of data-communications cabling from power cabling). Because of a lag in the traditional training system's uptake of the new technology involved, the vendors themselves initially provide the training.

One of the vendors noted that the industry standards which applied to their data-communications products, and which needed to be observed to ensure the correct functioning of their products, were not mandatory. Like many other vendors, in order to persuade contractors in the field to install the company's products in accordance with the industry standards, the company promotes and supports the practice of writing the installation and worker requirements into job contracts. For example, this particular vendor requires that at least 50% of workers employed by a contractor in installing the vendor's products should have completed training to the level required for ISO 11801 in order for the product warranty conditions to be met.

> Because there are no government mandatory standards for people to follow, what we, and just about all the other vendors have done is to incorporate them into our warranty schemes. We have simply said that, if you want us to warrant the installation in the building for, say, a period of 20 years, at least 50% of your workers on site during the installation work will have to have an appropriate qualification recognised by us and the industry … So we are actually forcing the issue on to the people that do our … work using the warranty program as the incentive for them to train. I am convinced that if it wasn't for this warranty incentive strategy (which contractors look on as an imposition rather than an incentive) I don't think you would get many people doing the training. Vendor

Changes needed in knowledge and skills

The training providers spoke of two clearly identifiable levels of knowledge and skills becoming necessary in the industry. The lower level was essentially that of the existing certificate III worker. At this level the worker is required to undertake basic installation which would include cable pulling (which some say could be done by a certificate II worker) and *fixing off* standard components such as power points.

At the higher level, usually identified as diploma or advanced diploma, the worker, usually referred to as a technician, may undertake design, installation, configuring and troubleshooting of equipment. Two essential attributes of the technician are high levels of problem-solving and communication skills. The latter skill is necessary not only to communicate with clients and industry specialists, but also, having determined what action needs to be taken in relation to an installation procedure or fault diagnosis, to instruct lower-level workers on action to be taken. It was generally agreed that the problem-solving skills required by a technician working with the new

technology would be beyond those of the typical certificate III worker who had not undertaken additional training.

> What we are really saying is that you need the tradesperson at certificate III level, there are no two ways about that … companies like Clipsal [have] new products [that] need someone at a higher level, say at a diploma or advanced diploma level. They are the trouble shooters and programmers, they will work out what the faults are within the systems they install. The installers have a black box approach—these are the inputs—these are the outputs—this how you wire it—this is how you test it. But then when it gets to the stage where it's got faults or it is not working properly and they are at certificate III level, they may not have the skills, unless they've taken an interest and upgraded, to be able to solve those problems. This is where you would have technician people at diploma or advanced diploma level who come in. I think the likes of Clipsal and others would value these people, but you would not necessarily need to have the same numbers of them. TAFE training provider

The diagnostic and advisory elements described above are already beginning to be recognised as essential to the technician role. While it was generally recognised that these higher-level skills are needed, there was said to be some lack of willingness within the industry to pay for the skills to be acquired. It was also noted that some of the skills are IT-based and that older workers, because of their lesser familiarity with IT, were less willing to undertake the training necessary to gain the new skills. Nevertheless, the consensus was that in an age of constantly advancing technology, continuous up-skilling of workers was going to be necessary.

> What is happening is that the skills that are required are becoming more and more IT based. In the case of older workers particularly, there is a real inertia towards moving in that area … The young guys who are coming through now have a high level of computer skills are already that much further ahead. Private training provider

Several contractors highlighted the increased use of computers on-site by contractor employees as part of the work they performed and as a means of communicating with their office and other people off-site.

> Our work sites are becoming more computerised. Before, we would [just] have computers in the office, but now our sites are driven and controlled by on-site computer systems. We correspond with our clients, consulting engineers and builders by computer systems, so it is becoming more than just an optional thing now … We'll find that within 12 to 24 months our servicemen will correspond with the office more and more by mobile e-mailing systems rather than over the phone. So we are finding that someone 40 or 50 years of age has just got to learn a whole new range of skills. It's starting to happen that just to be able to do a one man job now these skills are going to be needed.
>
> An ability to do Auto-CAD light drafting in the field is becoming more of a requirement for some of our workers … We've got a CAD draftsman sitting in the office who is now almost unemployed because we're doing so much out on-site. Contractor

Merging technologies are demanding that electrical employees and data-communications employees should each have at least a basic knowledge of the alternative field to that in which they were primarily working. However, as one contractor pointed out, some customers wanted specialists rather than multi-skilled people working on their installations.

> There is a perception in the marketplace that communications customers are reluctant to see your electricians, per se, doing their communications work. By all means they can have an electrical background, but they need to be specialised in communications work … We are talking here mainly of the top end of the market, such as the universities and the banks—customers who have got the really large communications infrastructure. It is probably not so true down in the lower end of the market where the customer's needs are not as critical.
>
> Contractor

There was agreement amongst contractors that, in order to obtain people with the necessary combination of electrical and data-communications skills, it was generally preferable to recruit qualified electrical workers and then give them the necessary communications training. To recruit data-communications employees and then train them in electrical skills was impractical because of the extensive training needed for the employee to reach licensing standard. It was far easier, instead, to provide an electrical employee with the necessary data-communication skills by means of a series of short courses.

New training demands and directions

Accredited training

Traditionally, accredited training provided by TAFE, and in more recent years private providers, has been the mainstay of training in the industry. As one contractor described it: *accredited training is a platform on which to build other training*. In following this traditional path the individual attended a training institution to learn the theory and engage in associated practice and this was complemented by on-the-job experience in the field.

The system of qualification acquisition through recognition of competency has also led to much greater use of short courses as a means of training. Many of these short courses are offered by either by private training providers or industry vendors of products and equipment.

By comparison with vendor training, the accredited training traditionally offered by TAFE is said by some to lack both currency and flexibility. As one training provider stated:

> If you look at the review of the current package which has been going on for three years, the outcome of that review is that we have still got status-quo … It hasn't moved to embrace new technologies … I don't feel that our current system, particularly with the award classifications that we have, is really allowing any greater up-skilling of our workers than what we have had in the past. … now, non-accredited [training] is the sort of area [people] look at … they do two or three days, a short course, get a piece of paper from the company saying you have done this and that … and you do quite a number of those. I would say that outside of [the] formal qualification the major area of up-skilling in is non-traditional training or vendor training.
>
> Training provider

In an effort to address this lack of flexibility, TAFE in Victoria was said to be looking at the possibility of recognising and accommodating merging technologies in the training it will be offering in the future.

One contractor highlighted a need for a more structured and nationally recognised industry-based up-skilling program that could take a person from certificate III level to higher-level qualifications such as diploma. The important feature of such a training program would be that it would be directly relevant to the industry.

> What we have to work towards now is a nationally recognised up-skilling program. The important part of it is that it be nationally recognised. At present there is no structured path through which we can all know exactly what a person has done. With [such a program] they could do modules which would be more relevant to our industry. That's a key factor—where [at present] you send a guy to do a Diploma in Business Management which is not really tailored to our industry, we want to tailor it to our industry … We are working on it now, between the manufacturers, the contracting association and the wholesaling association.
>
> Contractor

The types of training offered by a private training provider consulted for this study lends support to the view that training emphasis is shifting towards short, focused courses. This training provider offered what it referred to as *point skills* which were aimed at providing the learner with highly task-oriented skills and knowledge needed for a specific type of work.

> People come to [us] with the intention of gaining skills to find employment. We tell them we will give them 'point skills' which are particular things that will enable them to go out and get a job. This is what we do. We give a series of short courses; we don't do training programs that run for two years. We have a bunch of trainees that may be here for a year or two, but the majority of training we do, about 90% of it, is to individuals who come in for courses from one to thirteen days. These people are not here to get a qualification, they are here to get a point skill to get a particular job. Employers tell people that in order to get the job with them they should come to [us] for the specific point skills they will need in the job. Once they have got these point skills the employer will then take them on … The most basic of points skills that we do is to teach people to run jumpers for Telstra in their exchanges, you literally go and run a pair of wires to connect the exchange to the customer. That is point skill number one, when you leave here with that you can get a job with Telstra. Later on we get these people coming back saying that they want to do fault finding and that is where we begin to give them additional training.
>
> After the people have been coming back to us for some time and have been out on the job applying the skills and knowledge we have given them, they will have reached a level at which they would qualify for, say a certificate II, III or IV qualification. So they can get recognition of current competency. Private training provider

However a TAFE training provider pointed out that this approach creates its own problems. Because the non-accredited training is often very narrow in its scope, it can leave gaps which prevent a person from gaining formal recognition towards an AQF qualification. While TAFE can and does offer gap training to compensate for this, it is only practical to do so when sufficient people can be enrolled to form a class.

> RCC [recognition of current competencies] or RPL [recognition of prior learning] can be applied but you will find that those non-accredited training programs are still very narrow so there are still gaps and it is difficult to give them any formal recognition or even a statement of attainment, particularly under the current training packages because they are so large. That's the point that we make: [people] do all these courses and then they come to an RTO and say 'can I pick up the cert IV' and generally we have to say you have not got enough training to pick up the qualification. Training provider

A TAFE curriculum designer suggested that there is a need to move away from what he referred to as *very long and prescriptive mega-competencies* in training packages. In reference to training packages, he also went on to say there is an increasing need for workers to be able to problem-solve for clients and make recommendations—skills that are currently not much fostered in the trade. As well as the traditional learning of electrical technology and the electrical skills, he said, it is equally important that higher-level workers in the industry become good communicators. Such skills were said to be in demand because of their importance in selling new products and generating work. For this reason he suggested that greater emphasis be placed on them in training packages.

Vendor training

While traditional generic training provided in accordance with training packages is comprehensive, it often lacks the currency and specificity needed to deal with constantly changing technology. Vendor training, on the other hand, may lack comprehensiveness but it certainly meets the needs of companies and their workers.

> They say that the vendor training only covers about 50% of the stuff that is needed and we [TAFE] have to provide the other 50% to fill the gap. But rest assured, what vendors are doing in terms of training is exactly what they need out there in industry—and the vendor doesn't teach too much or teach too little … It is short, sharp and to the point. You would be hard pressed to do anything like it in the TAFE system because of systemic delays. Accrediting something takes some time—you have to have consultations, it has to be developed, then you have to seek state funding, and by the time you've done all that, what

> you wanted to achieve is probably yesterday's technology and you find the vendors have moved on in the two or three years that the process sometimes takes. I think vendor training is a good way for people to get into leading edge technology very quickly. I think the public RTOs, and even the private RTOs with public funding, cannot respond quickly enough to do that sort of thing. TAFE training provider

The perception that the accreditation process hindered training development was confirmed by one of the vendors, who agreed that, because they operated outside the national accreditation framework they were able to respond rapidly to the demands of new technology. Another vendor pointed out that their training had to be up to date to enable the company and its new products to survive—an argument echoed by a TAFE training provider.

> TAFE tends to lag behind in its currency of knowledge compared to vendors who move more quickly in keeping up with developments. If we are not on the cutting edge then we are not selling and we are not installing. The needs relating to our installations have to be at the forefront of everything. Vendor

> If the vendor has a product that he wants to get on the market and new technology is involved and contractors and electricians aren't able to access training through the formal training system, the only way that product is going to survive is that there will be enough people that the vendor has trained who will be able to install and mend it. If not, it will die. And, as has been said before, the vendor will only give you what is required to make that product work. They are not worried about giving you advanced skills, it's about getting the product out onto the market. For the contractors to survive and have an income they too will have to keep up with the technologies. TAFE training provider

And as one vendor pointed out, *We don't train for training's sake, everything we do must be to meet a need for training*. One of the training providers observed that vendor training also served another purpose, that being, to cultivate and reinforce customer loyalty.

There was consensus both amongst the majority of training providers and vendors interviewed that the amount of vendor training has been increasing for some time and will probably continue to increase. Several commentators noted that there was a reluctance of employers to allow time off for study unless it was seen to be essential to their needs. However, one of the training providers also pointed out that employers were still sending valued key employees to TAFE colleges to do diploma and advanced diploma training. One of the vendors also described a newly developed on-line course which, although slow to start (possibly because many of the students were not familiar with this mode of learning), was showing promise as an alternative to the classroom-based course normally undertaken.

> Our [name of course] is available on the internet. [We] supply on-line PDF versions of the manuals and do on-line assessment in which the students interactively answer questions on line and receive immediate feedback. The PDF based teaching and on-line assessments are equivalent to two days of theory out of a three-day course. On the third day, after the students have successfully completed all of the theory component they have to present to the trainer to do the practical demonstrations and testing to confirm their competence, and to authenticate the student's identity. [We] trained about 20 or 30 people by this means in 2005 and expect to double that in 2006. It has been rather slow to take off, because students are not very used to using computers in this way. Once again, employers are already complaining about the amount of time it takes—they would prefer their employees not to have any time 'off the tools' at all. Vendor

One of the training providers noted that the most important vendor training was at the high end of the technology spectrum. He went on to suggest that vendor training at the lower end of the spectrum, such as installing cabling, was a *waste of the economic dollar*, and that the real push behind provision of such training was marketing and the generation of customer loyalty rather than provision of important technological information.

> Vendor training is more at the high level. At the other end of the scale, cabling for example, the training is purely and simply for marketing purposes—you don't have to be taught by every single vendor because they are all producing the same type of product with variations on the theme and there is just not enough difference. At the top end of the market, such as where you are putting in voice communications systems and automation systems, you really need to understand how to install and configure that product to deliver the requirements.
>
> At the low end of the market which would be the cabling end, I would say vendor training is a waste of economic dollar. It is just trying to add value that doesn't really exist. The rationale behind it is marketing—if you have done our training course then we can offer this certification and we will warranty the installation for twenty years. However, under that warranty the contractor would provide the labour and the vendor would provide the products, and it is the labour that is the most expensive item. It would also be unlikely that the client would still have the original system twenty years later. Private training provider

There were differing opinions about the need and practicality of accrediting vendor training. One of the vendors felt that, while there would be some competencies in training packages that would match what was contained in their training and there could be some advantage in the training being accredited, the training was so specialised and the competencies would be so hard to match up that the benefits would be outweighed by the complexity of the accreditation process. However, in discussing the possibility and value of collaborating with TAFE in the development and provision of training, the vendor went on to suggest that such collaboration might assist in any steps towards accreditation. Accreditation of vendor training was also seen as a step towards accessing government funding for training.

> I think there would be some advantages in incorporating our training into the accredited training system: one is that there would be a transferable recognised skill that you could take somewhere else which would give you a working advantage. However identifying all the competencies would be a bit of a minefield. I think we see some value in accredited training but it is how we pull it all together and get through that minefield of competencies that would be the difficulty… our training is very specialised, so I'm not sure that there would be sufficient benefit in having it accredited. Vendor

One of the training providers consulted suggested that over time technology that was once at the cutting edge eventually becomes widely recognised and accepted, to the point where de facto standards develop and the training becomes almost generic.

Another training provider would like to see structures and procedures developed which could make it easier for vendor training to become recognised within the training system.

> What we need to look at is some sort of instrument that we can use to make it easier for vendor training to become recognised. Or when we do training packages—that we are actually aware of the vendor training that goes on in major areas of the training package. You have the Clipsal C-buses, PLCs, and in the computer areas and the electro packages you have Cisco and the network people. They are all vendor training and when one does the training package it needs to be designed in such a way that the competencies are flexible and you can actually contextualise it. But unless it's taken care of at the design stage of the training package you have lost that opportunity. You do not build in the vendor training per se but you can look at different vendors and say that this is what they typically do regarding basic PLCs [for example]. So you can slot the vendor training into it. Training provider

Collaboration between vendors and TAFE

Regarding the issue of collaboration between vendors and TAFE, general opinion was that it could be beneficial for both parties. From the TAFE perspective, one of the main benefits of the collaboration was that it could assist TAFE in keeping up to date with new technological developments. From the vendor perspective, an important benefit would be access to the extensive course development and teaching resources TAFE possesses.

One of the vendors consulted stated that, whereas in the past they had chosen to do their own training, the concept of collaboration with TAFE was now looking more attractive. The essential condition for this to be feasible was that the vendor must be able to maintain ownership and control over the training and any commercially sensitive information. Other potential benefits of collaboration identified by this vendor were the possibility of developing and disseminating nationally uniform training and gaining accreditation for the training.

Apart from the ownership and control issue just mentioned, the only other concern this vendor had with the concept of collaborating with TAFE related to conditions and demands placed on the company in order to satisfy course length, contact hours, class size and funding requirements.

Although another vendor has had extensive interaction with TAFE in relation to its products and the use of TAFE facilities for vendor training purposes, the vendor did not see any advantage in working collaboratively with TAFE in relation to vendor training provision. One perception which militates against collaboration with TAFE in this regard is the apparent fragmented nature and lack of unified approach that TAFE projects, both within states and nationally. The company responds to numerous requests for information, assistance and donations of its products from TAFE departments and colleges all over Australia. Many of these requests are for the same or similar things and it appears that there is little communication between the various state training authorities and colleges. This vendor would be more amenable to collaborating with TAFE if it presented a more coordinated image.

Vendor training was only specifically mentioned by about one-quarter of the contractors interviewed, in most cases being mentioned in relation to data communications. Contractors confirmed that vendor training was often necessary for the purposes of product certification and warranty endorsements. Without it, customers' product warranties would be at risk if the contractor worked on their equipment. While some particularly commented favourably on its currency and relevance, others expressed disappointment at a tendency for the training to turn into a *sales pitch* for a product. One contractor said he avoided vendor training because 'it tends to tie the company to the vendors a bit too much'.

> The company is very disappointed when a training session is conducted and it turns into a *product sell*, rather than a technical skills training session.
>
> Medium-sized communications/electrical contractor

Other issues canvassed with contractors

Company profiles

Workforce sizes of the contractors interviewed varied between a total of five employees and 900 employees. All companies employed apprentices, usually representing around 20% of their work-force. For most companies, about half to two-thirds of their workforces were aged between 25 and 44 years. Of the remainder, the proportion aged fewer than 25 years was approximately twice that of those aged 45 years and above. For these companies at least, the 'ageing workforce' syndrome appeared to be offset to some degree by the substantial proportion of apprentices employed (only a few of whom were mature-aged or 'adult' apprentices).

It should be noted that the companies interviewed were a selected sample from the NECA membership and all respondents appeared to have a genuine interest in training issues and the welfare of the industry. It seems reasonable to assume that not all companies in the industry would be as altruistic. Because most of those interviewed appeared to have close associations with other industry members and organisations, it was felt that they were well placed to reflect the general opinions and concerns of the industry about skills and training.

Only a small proportion of the company workforces were female. In most cases, the entire female component of the workforce was employed in an office environment. Female trade and technical

employees were very rare. While contractors were not generally averse to employing female tradespersons, most said the work was physically fairly demanding (working in roof-spaces etc.) and not generally attractive to females. Some remarked that building companies were not always happy about contractors employing females on building sites because it could impose additional obligations (and costs) on the builder for provision of appropriate workplace facilities.

> We don't have any females in the field. However I like to have women in the workforce—they make very good bosses. If you can keep the girls on until they get through to the end, they make very good managers. Medium-size regional electrical contractor

Almost all field and technical staff (tradespersons, supervisory staff and managers) were employed permanently and full-time. Where there were exceptions, it was usually restricted to a few contracted workers employed for specific purposes and the occasional storeman or yard worker. Most office staff were also employed permanently and full-time; however, there was a slightly greater likelihood of their being employed casually or part-time than was the case for tradespersons.

Many companies do both electrical and communications work. Where this was the case, it was common to find a mix of about 80% electrical and 20% communications.

The next two sections report on contractors' views on skill shortages and training.

Skills shortages

About three-quarters (15 of the 21) of contractors interviewed reported that they were currently experiencing shortages of skilled personnel. Almost without exception, those who did report skills shortages said they would employ additional electrical tradespersons if they could find them. They also identified an acute shortage of higher-level tradespeople with supervisory skills, such as foremen and leading hands and people with leadership skills and management ability. One also reported *a definite shortage* of workers with high-voltage knowledge who have experience in cable terminations and the like—the existing ones were said generally to be older people. The same contractor also noted that there was a shortage of workers with experience in *large-scale work*, again stating that those who still existed in the industry were generally ageing or in supervisory roles. Another contractor stated that it was harder to find workers with commercial skills than with domestic skills.

Coupled with contractors' comments about current skills shortages was a view amongst a few that this shortage wasn't necessarily long-term; in fact, one stated that, as a number of major building contracts in Melbourne came to completion over the next few months, there may be an over-supply of qualified tradespeople. Another cited an industry downturn after major projects associated with the 2000 Sydney Olympics.

Some contractors stated skills shortages depended on location and the economy.

> Queensland has the worst supply of labour generally in the building trades—it's quite serious, we are unable to quote for some jobs and customers feel we can't offer them a service, Sydney and Melbourne are OK. Large electrical contractor

Exodus of older tradespersons

One contractor noted that, because of the physical demands placed on electricians by the nature of their work, older employees (45 years age and above) tended to move out of field work. If they could not find a higher-level, less physically taxing job with their employer, they were likely to move to other employers with whom they could. An example quoted was moving to working with a local council maintaining a pumping plant which was all shop-floor work, not involving working in roofs.

Effect of stringent regulations and compliance requirements

There was a view that there is an emerging skills need in the trade generally. One contractor suggested the trend towards compliance and regulations has contributed to a *skills shrinkage*. Two examples were provided:

- The constant supervision of apprentices has now born a generation of tradespeople who lack a sense of confidence, intuition and ability to try possible solutions. It has created a tradesperson who lacks critical basic, traditional skills who is not prepared to try different approaches to a problem for fear they will get it wrong and cop it from the boss.
- Basic employability skills are being lost because of the drive to comply with the *Office of the Chief Inspector* and requiring one-to-one supervision of all apprentices—something that has commercial cost attached to it. If those costs had not needed to be expended on such close supervision, they could be spent on instilling basic employability skills such as initiative, intuition and manufacturing skills.

Generally, while there were also shortages in data and communications workers, they were not as acute as for electrical workers.

The following is a list of skills shortages cited (most frequent at top of list):

- all electrical tradespersons, but especially industrial/commercial (as opposed to domestic)
- service workers
- leadership staff (middle management, foremen, leading hands, project managers)
- high-voltage electrical workers
- estimators
- programmers (especially *high-end*)
- communications workers
- IT cabling.

Impact of skills shortages

Employee turnover

Some contractors reported turnover of employees as a problem, as workers either moved around in the industry or out of it altogether. One commented that this was especially a problem for his company in regard to service people (those involved in day-to-day servicing and maintenance of existing installations). The company was said to invest a large amount of time in training these workers only to see them leave.

> There does not appear to be a difficulty in attracting people to the industry at entry-level—but we have difficulty in keeping them in the industry, particularly toward supervisory/mid-management positions. The lack of strong skills at the middle management and supervisor levels is serious and is a potential in preventing growth for the company in the future.
>
> Metropolitan NSW electrical contractor

> The market needs [licensed tradesmen]. We will see four or five ads run on a weekend for electricians, and the companies will get no responses. We are not looking for any highly specialised skills, just commercially trained electricians. We've been looking for servicemen lately but you can't get them for love nor money … We can use specialist sub-contractors for setting systems up, but often we can't get them back to [service] them, so you have got to have people who can do [servicing]. Regional electrical/communications contractor

Staff turnover was a problem where apprentices have recently completed their indenture and have achieved their licence. They are offered better money or opportunities with other companies who traditionally have not employed apprentices in the past.

A number of contractors indicated that their workforces were quite stable, this being attributed to there being a variety of work across the company with a supportive and relaxed environment, particularly where enterprise agreements were in place or the company was in a regional location.

Lost business opportunities and inhibition of company growth

Impacts include stretching resources and potential delays, although these issues are often over the short-term. Some contractors, in extreme cases, indicated that they may need to relinquish some customers because they could not be serviced to the extent the company felt acceptable.

It was common for contractors to claim that their shortage of skilled workers was forcing them to turn away work and constraining their company's growth.

> In the last three weeks I've pushed four tenders away—major tenders that I have not completed or priced because we don't have the workers to do the work. And now they are talking about going and getting contractors from out of state to do the work. They are killing us. Here's a chance to make a few bucks and to do well and train people, so what do we do, we go and get people from some other state—and it's all to do with the fact that we can't get people. Regional electrical/communications contractor

> We have to think twice before we take on a large project—about increasing the business size. Small commercial and industrial electrical contractor

> Being in a service industry, we live and die by our service levels and [skilled labour] shortages are making it difficult to cover all bases. It is certainly stifling our company, there's no doubt about it. Large commercial electrical/communications contractor

> What [skilled labour shortages] are doing at the moment is stifling opportunity. The lost opportunities could become a problem. Large commercial/light industrial electrical contractor

Poaching of employees

Poaching of employees by one company from another was also said to be a problem. While most contractors did not say they had been unduly affected by it, almost all had anecdotal knowledge of its existence. (It has to be said that many of the companies interviewed had well-established social and support programs for their employees and worked hard to foster good employee-employer relationships, measures which no doubt helped reduce the risk of employees succumbing to poaching offers.)

> [Poaching] does go on. We have not had experience of it but, anecdotally, I have heard people say that contractors are actually waiting at the TAFE or training institutions for the students to come out and then offer them a job, which I find quite frightening. I haven't had any experience of it. But I am curious as to whether any of my employees have been approached, I plan to ask them … Regional electrical/communications contractor

> I would consider that just about everyone who has left us has been poached. Because we are so diverse and we offer our apprentices such a wide range of training—after they have spent a couple of years with us as a tradesman, everyone wants them. Large commercial electrical/communications contractor

> We do see [poaching] as a problem, especially with good apprentices. It appears that some other companies don't want to be involved in training. Large industrial electrical and communications contractor

> If this trend [poaching] continues, I will resist employing apprentices and only employ sub-contractors—thereby reducing overall positions and opportunities available for apprentices. Medium-sized electrical contractor

Escalation of wages

Some contractors stated that, as a consequence of the competition between companies for skilled labour and the poaching that was said to be taking place, wages paid to employees were increasing.

Quality of recruits

In commenting on skills shortages, several contractors also noted that the shortages resulted in their being forced to employ workers of a lower standard than in the past. One contractor said that, faced with the choice of hiring a substandard worker, or making do without, he would choose the latter course and ask his existing employers to work extra hours instead.

> I think there are people working in this company now who, five years ago, wouldn't have got a job here—they wouldn't have been acceptable because their standards were too low. So we have got to drop our standards to take what we can get. That makes the supervisors work a lot harder and just generally dumbs down the company. That's not good in a regulated industry like ours because we have the regulators on our tails.
>
> Large commercial electrical/communications contractor

> If I know a person is of a low standard, then I would rather do without than be forced to accept someone who would lower the standard of the company's work force. I would rather struggle and pay someone more overtime than risk the damage that they can cause. With the type of work that we do, like hospitals, you have to have competent people.
>
> Large commercial/light industrial electrical contractor

> What I think is even more disturbing is the quality of people. There are a lot of people out there who don't give a rats—the care factor isn't there, they accept mediocrity—I really struggle with that.
>
> Industrial electrical contractor

> The level of technical expertise and experience to become qualified in the trade has diminished over time, and new tradespeople lack the breadth and depth of skills to apply traditional tradesman's skills to a task.
>
> Metropolitan electrical contractor

Strategies for dealing with skills shortages

Changes to the apprenticeship system

Employment of more apprentices

Many contractors have sought to redress their workforce shortages by employing more apprentices—either directly and/or through group training companies. However, one reported that, while he would like to employ more apprentices, he is constrained from doing so by the limitation placed on the ratio of apprentices to tradespersons.

Changes in format and emphasis of apprenticeships

One contractor suggested consideration should be given to strengthening the traditional four-year apprenticeship and in some cases increasing it to five years. As it is, fourth year apprentices do not undertake any off-job training and are supposedly working under limited supervision. In reality they are now working under direct supervision without an opportunity to further increase their skills base in *off-job* environments. A stronger focus on 'trades' skills (as opposed to *over the counter* installation skills) would increase people's skills bases and probably lead to a greater engagement within the industry.

Increased apprentice subsidies

Some contractors suggested that apprenticeships must be made more attractive to both employer and employee alike. Subsidies should be increased to both employer and employee, which would provide greater incentive to both parties to increase skills at the apprenticeship level.

Mature-aged apprentices

Some contractors are giving consideration to adult (mature-aged) apprenticeship as a means of relieving the skilled worker shortage. However, one employer suggested that the government is not doing enough to assist mature-aged apprentices (see *Insufficient financial assistance for mature-aged apprentices* in Barriers to training section later).

> [Mature-aged apprentices] come with a more stable background. The two we put on this year are both married with young families. Employees like that are more likely to stay with the company. If they have made their mind up that they will forgo some wages to do their training you can be pretty sure they are going to give it 110%.
>
> Very large industry/commercial/domestic contractor

Career path/plans opportunities for apprentices

One contractor outlined the long-term approach they were taking to the employment and career paths of their apprentices.

> We have an 8–10-year strategy for building a skilled workforce—by that time an apprentice will have gone through their 4-year training time, then spent a further four years on the tools. They will then make good managers, supervisors and upper management for us. The company tries to demonstrate that if you are prepared to have a go you will be rewarded with opportunity.
>
> Metropolitan electrical contractor

Apprenticeship in the future

During the preparation of this report, the Australian Industry Group (AIG) released two related publications dealing with apprenticeship: *Contemporary apprenticeships for the twenty-first century* and *Making the economy work better: a model for contemporary apprenticeships*, both of them published in July 2005 and available on the AIG website <http://www.aigroup.asn.au/scripts/cgiip.exe/WService=aigroup/ccms.r?pageID=963>.

These papers, which are based on the views of AIG members, reflect some of what the electrotechnology contractors interviewed for this report have said regarding apprenticeships.

Human resource and industrial relations strategies

Assurances of support, security and stability of employment

One contractor suggested that, in order to attract new entrants, the industry should look towards offering security and stability of employment—something that is not always easily provided in some sections of the electrotechnology industry. Another claimed to have adopted a policy of greater tolerance and support in order to attract and retain workers.

Additional benefits to workers

A number of contractors are using enterprise agreements to offer additional benefits to workers. Another was proposing to offer profit-sharing arrangements as a means of maintaining current senior staff. Additional training opportunities and the development of career paths within the company were also cited as means of attracting and retaining staff.

Increased pay rates

Some employers noted that pay rates varied across different sections of the industry. Electricians working in the construction industry were paid considerably more than those working in the domestic market, for example. However, as one contractor pointed out, those *higher rates come at a price, construction industry sites are extremely full-on in terms of intensity and aggressiveness, construction work is a different world.* Others suggested that, while the higher rates in the industry were very good, the electrical trades would look more attractive if the bottom rates were raised.

> Talking for my company, which uses the construction industry EBA, [our pay rates] are extremely good. However for the lower end of the market, the domestic market, it is shocking. But that's the employees' choice, they don't have to work in that market—they are

aware of what we are paying. You are talking of big differences of around $7 to $8 an hour. The award rate needs to be lifted, it's a massive process, but that is where you have to start from. Large commercial/light industrial electrical contractor

Waiving of payroll tax for workers in training

Several employers cited abolishment of payroll tax as an incentive for training, particularly in relation to training of apprentices.

> There could be some useful incentives such as waiving of payroll tax—which should be the minimum benefit you should get for training an apprentice. You should not have to pay payroll tax. That used to be the case many years ago, but not now.
>
> Large commercial/light industrial electrical contractor

> Subsidies? We get a little bit. I think we should get more. I have got a bit of a beef with our government regarding payroll tax. I think it is ridiculous. If that money went into training, the whole thing would work better. Large commercial electrical/communications contractor

Attraction strategies

Recruiting skilled workers from overseas

Several contractors had either employed or were considering seeking overseas recruits. One respondent, whose partner in the business came from an eastern European country, was *putting out feelers* to the partner's relatives in Europe in the hope of finding some suitably qualified tradespersons interested in emigrating to Australia. The company would be looking for persons who were reasonably proficient in English so that they could quickly learn the Australian regulations and have their qualifications recognised. Two employers specifically mentioned recruitment from South Africa.

> We have had three South African trained electricians. These people came [with their families] from South Africa. Of those three, two are still working with us. One has exceeded expectations, one has met expectations and one failed. We did not seek out these employees, they approached us for employment. There is lots of red tape, but the company employs an HR consultant to handle all that. Large industrial/commercial/domestic electrical contractor

> I was interested in an article in the local business paper that they put out here which indicated that there were tradespeople who were keen to come out from South Africa. We are looking at that as well at the moment. … if we could get half a dozen tradesmen who had their ticket from their own country and who know the basics, we could certainly help them work through the local rules [and get skills recognition where applicable].
>
> Very large industry/commercial/domestic contractor

However, another contractor highlighted the difficulty an overseas person faces in gaining an awareness of the industry and its regulations in order to seek recognition of their competencies when they are prevented from working in the industry unless qualified.

> So far as I know, there are not too many qualifications from overseas countries that are recognised in Australia—UK might be one and possibly a few others in Europe. I am on the Trades Recognition Council and I see very few overseas people applying to have their qualifications recognised. In some senses it's another Catch 22, a guy can't get into the industry unless he is qualified, and he can't get qualified unless he is in the industry.
>
> Small electrical contractor

Jump-start for school leavers

A South Australian employer spoke enthusiastically of a new scheme that assisted school leavers to enter the industry with already acquired qualifications in data communications by undertaking communications training in their senior secondary years (see more on this under *Data Trak training scheme* in the later section on training, Strategies and training plans for the future).

> … it [Data Trak] appears to be working very well, it has attracted some outstanding kids.
>
> Large industry/commercial/domestic contractor

Need to make electrotechnology trades more attractive to school leavers

Generational factors were mentioned by one contractor as having an impact on the ability of the industry to make itself an attractive career option for young people. Many employers felt that, for some years, careers in trades have been presented to secondary school students as a second-best option by comparison with university based careers.

> The industry needs to be promoted face-to-face—that is getting some knowledgeable people from the industry to talk to schools and the children. People like myself, who run businesses, need to go in there and talk to them as a real person and tell them what the opportunities are—it's not just digging a trench and putting the cables in, it's become sophisticated and there are a lot of paths at all levels. That's the sort of thing I think they are not being told. They think of an electrician is just a wire-jerker. I've had discussions with several [career advisers] and they really don't have a clue what an electrician does, and they've admitted it.
>
> Large commercial/light industrial electrical contractor

> I went to a local high school with a population of 400 to 500 students and put in a day there in which I, and others, gave a presentation. Then afterwards we had some classes for about an hour in which they asked questions and we went through things with them. I was disappointed that from all those students our company never had one put in for an apprenticeship that year. Very large industry/commercial/domestic contractor

Increase employment of females

One of the notable findings of the interviews was the scarcity of females in technical/trade jobs in the industry. *In many cases*, one contractor said, *females were only exposed to technical/trade opportunities in the industry through family connections and friends*. Several contractors in their general comments about the proportions of women in their workforce felt that some types of jobs in the industry, such as those entailing working in roof-spaces, were too arduous for many women. On the other hand, some aspects of the communications sector were seen to be particularly suitable. Two respondents suggested recruitment of females into the technical/trades areas as a means of redressing skills shortages. Suggested measures to encourage recruitment of females included: providing greater flexibility in the workplace and developing better ways of publicising the industry to women.

Business strategies

Partnering with project management companies

As a new business strategy, one company has adopted a policy to form partnerships with project management firms rather than with building firms. The company believes it can secure more consistent work flows with project management companies by comparison with the traditional source of work through building firms. This new strategy may require increased demand for project management/client management skills in the future. It is considered too early to tell if the strategy will be successful—but the company's skilled labour supply is currently meeting workflow demands.

Instilling a sense of company identity

A couple of contractors described strategies they used to instil a sense of company identity, commitment and support through use of appropriate leadership style, open communication and social activities. Retention strategies included bonuses based on performance, regular social functions, company newsletters, profit share and further development.

Recruitment

Many contractors relied on word of mouth to attract potential employees. Some advertised in the paper and managed their own recruitment processes. Most tended not to use recruitment agencies,

except for management roles. Some selected their apprentices from pre-vocational programs or work experience candidates. A few had developed relationships with local schools.

Contractors indicated that they look for a balance between technical skills and attitude, both being equally important.

> We look for someone who is well groomed, presents well, is reliable, and has a basic set of technical skills. We'll give older guys a go. Small commercial and industrial electrical contractor

> We retain our staff by developing them, maintaining company culture and spirit, with salaries as secondary. Large electrical contractor

> We've adopted a different approach and we'll give people a go. If people have some personal problems we'll work them through or if they aren't turning up to work—we are more tolerant and focus on other skills and attitude. It's our personal reputation.
> Small commercial and industrial electrical contactor

Some employers reported that they were assisted in their recruitment of apprentices by their good relationships with secondary schools (particularly through VET in Schools programs), group training companies and TAFE institutions.

Several contractors referred to the low profile, even poor image, of the industry (particularly in relation to the trades) in schools and in the perceptions of parents. One of the keys to increasing the recruitment of young people into trades in the electrotechnology industry may well be to enhance the public image of trade employment in the industry, especially amongst schools and parents.

> I think a lot of the problems encountered in getting the right people into the industry are related to the profile of the industry. It seems that, with a lot of the kids coming out of school today, their first preference, and if not theirs, their parents' preference, is that they go to university. I think that the problem lies in convincing the parents and the public generally that the electrical industry is a very high tech industry. The industry needs to better present itself to the young people in schools and the community generally. But, as an industry we can't afford to run a 'practising accountant' type of campaign—I'd like to see government put money into certain industries to lift their profile. If we can attract the right people we are going to end up with better tradesmen. And, with the pathways available today, with a basic trade background you can go on to whatever higher level branch you like, whether it be electronics, engineering or whatever. Small domestic contractor

Some contractors said they are assisted in recruiting apprentices by their local group training company. The group training company puts candidates for apprenticeship through a screening process testing their physical and mental aptitudes. Lists are then forwarded to employers, who, based on their test scores, then select candidates for interview and employment. An industry training advisory board was said to provide a similar service.

Some companies find that work experience is also a good aid in finding and selecting apprentices.

> What I've done in recent years is to get potential apprentices to do work experience. Very quickly, within a week, we can see if they've got the 'can-do' attitude, if they present well, and if they've got good hand-skills. I think this is the only way really. The other way is to just interview and run psych tests on them. But when I've done that it has actually failed, so I revert back to work experience [as the starting point]. What I do is get them to ring up and present themselves over the phone, from there they come in for a five minute interview, we lock into a week for work experience and we go from there. It's a bit of a shotgun approach, but when you do find one you sign them up straight away. We have people coming for work experience 15 to 20 weeks of the year, out of which our target is to employ two or three apprentices every year. Large industry/commercial/domestic electrical contractor

Other companies find pre-vocational training to be a useful introduction to potentially good apprentices. One contractor described how it worked: the local TAFE and the private college ring the company during the year and ask how many pre-vocational students the company wants to take

for work experience. The company then accepts them for work experience which gives it a chance to observe them. This serves as a means of screening potential applicants. It finds selection through pre-vocational training so useful that most of its apprentices come by that route. The company typically gets about 100 letters a year from young people leaving school and looking for an apprenticeship. It writes an encouraging letter back thanking them for their interest and suggesting they consider undertaking pre-vocational training. Every person who has done a pre-vocational course who writes a letter of application is given an interview.

> We do not use VET in Schools. All apprentices are now selected with a pre-vocational background. Even those who are a relative of an existing employee are first asked to complete a pre-vocational course before they are accepted. Large commercial contractor

One contractor stated that NECA also assisted companies in selecting apprentices.

> For the last recruitment drive, NECA circulated [material to] some of the schools inviting students to come along and do an aptitude test on a Saturday morning. They did that and [we] and other companies were given a list. I took two of the seven or eight top performers, and the rest went pretty quickly. Our company also has its own aptitude test which applicants have to do. Large commercial/light industrial contractor

Training activity within the electrotechnology industry

Current state of training

A considerable proportion of the training referred to was informal and non-accredited. Added to this was the certificate III level training for apprentices and certificate IV level and above for post-trade and management staff. All contractors spoke of the importance of informal training—provided on a needs basis and on the job.

Training in larger organisations was managed in a fairly decentralised approach, with department managers responsible for staff training.

Employer support for training

A number of companies actively encouraged their employees to pursue further training.

> I am encouraging my young blokes [fourth year apprentices] to keep going with their studies and do some basic training [in estimating and management] while they are still in technical college. I'll pay for their courses, and they will most likely go in their own time.
>
> Regional electrical/communications contractor

One company used a specially designed survey to develop a skills matrix for each employee. This skills matrix was used in determining the overall skills level of the employee which in turn helped determine the salary paid. An equally important feature of this system was that the skills matrix was also used to guide the employees in planning their career paths and future training. This company appeared to be unusually supportive of employee training and covered the full cost of any training successfully completed. (The company also worked hard at fostering a healthy employer–employee relationship, which included an annual 50-item questionnaire which invites employees to rate the company across a variety of areas and provides feedback from employees on their perceptions of the company and their jobs.)

Examples of training undertaken

The wide range of training topics cited by the respondents as being undertaken by employees included:

- ✧ Scissor lifts
- ✧ Forklifts
- ✧ First aid

- ✧ Rescue and resuscitation
- ✧ Asbestos handling
- ✧ OH&S
- ✧ Working in hazardous locations
- ✧ Powder-activated (explosive powered) tools
- ✧ Communications, including Austel, vendor training, PABX certification
- ✧ Fire and security
- ✧ Electrical testing
- ✧ Industry compliance
- ✧ AS 3000 wiring rules and updates
- ✧ High voltage electrical
- ✧ Industrial electrical
- ✧ Programmable logic control (PLC)
- ✧ Computer-assisted drawing (CAD)
- ✧ Site supervision
- ✧ Project management
- ✧ Business skills—negotiation, planning, estimating, budgeting
- ✧ Management courses (with Australian Institute of Management)
- ✧ Financial modelling course, for managers (Certified Practising Accountants).

Several companies mentioned *tool-box* meetings in which training was given on the job, often regarding safety-related issues, changed procedures and new developments.

> We have got safety supervisor training going on a continuing basis. If an incident involving OH&S occurs we will go around to every site and have a toolbox meeting where we can sit everybody down and say this is what happened, this is how things need to be done in future.
>
> Large commercial/light industrial electrical contractor

Providers of training

External training was supported by a broad range of providers. Those cited by contractors included:

- ✧ Private general electrical and communications providers
- ✧ Private specialist providers (especially in communications)
- ✧ NECA affiliated trainers (e.g. College of Electrical Training in WA and PEER in SA)
- ✧ TAFE
- ✧ Group training companies
- ✧ Master Builders Association (MBA)
- ✧ Business SA
- ✧ Management and Research Centre (MARC)
- ✧ Fire brigade (fire training)
- ✧ St. John (first aid)
- ✧ Unions

Although TAFE still provides much of the training, particularly for apprentices, opinions from the contractors suggest that non-government providers in the form of group training companies and industry associations are increasing their share of the training market.

> By comparison [with TAFE], group training schemes are more industry focused, only electricians. Electrogroup and NECA are very individualised and focused group training providers—only interested in electricians in our industry which makes them quite vital and more dynamic—they are looking at what we need.
>
> Regional electrical/communications contractor

Internal training

Only a few contractors had accredited trainers in their workforce, usually in relation to OH&S. However, most claimed to provide informal on-the-job training in various aspects of the work, such as wiring rules and safe operating procedure. This training was usually conducted by highly experienced senior field personnel.

> We conduct in-house training on safety issues and use of power tools. A lot of that is done here by our operations manager who is an accredited trainer.
>
> Large commercial/light industrial electrical contractor

TAFE training

While a majority of contractors used non-government providers for their training generally, most used TAFE as their provider of training for apprentices. Other providers of apprentice training were group training companies. In some cases TAFE training was the only option for apprentice training. TAFE training tended to be viewed by contractors as fairly conservative but generally reliable. Where there were criticisms, they were generally focused on either a lack of currency of training or lack of relevance to the contactors' needs.

> TAFE is the only training available to us. Traditionally, it has worked well. There have been times when they have dropped the ball, but NECA keeps an eye on the modules and the system itself to ensure that TAFE is doing the right thing and keeping it up to speed. Generally they are doing a fairly good job—by the industry and by the apprentices.
>
> Small electrical contractor

> TAFE does not provide everything that our company would like but it has to cover a very wide cross-section of industry and cannot be all things to all people. For example pulp mills would like their people to do a lot on PLCs, whereas for us, employees would only have to know the basics. However, I do think they go too quickly over all the basics.
>
> Very large industry/commercial/domestic contractor

> About 99% of [our apprentices] do their training via [a group training company]. That was a conscious decision we made a number of years ago because we found that TAFE was not particularly customer-focused in terms of providing feedback to us on our apprentices and how the apprentices were going, whether there any issues … [TAFE] also needs to be looking at other non-technical issues such as quality systems and customer service. Contractor

> With the apprentices we try to steer them into the communications areas as well. Apprentices can select some communications modules in their TAFE training so that they end up with communications skills too. Small electrical contractor

Pre-vocational training

Virtually without exception, contractors who had experience of employing young people with pre-vocational training spoke highly of its benefits. It was evident from their remarks that pre-vocational training experience was viewed favourably when applications for apprenticeship were considered. One employer, for example, stated that he no longer apprenticed any young people who had not undertaken pre-vocational study.

> We have a pre-vocation course in which young people do some modules including OH&S and a bit of practical which makes them more employable than a kid straight out of school.
>
> Small electrical contractor

> Pre-vocational training is definitely an advantage. Generally, when we advertise for apprentices we usually go down to the local TAFE college and interview pre-vocational students who are just completing their course. The problem with the pre-vocational course is that, in [our area] at least, they only take in a limited number of students (12 or 15 each intake).
>
> Very large industry/commercial/domestic contractor

VET in Schools

While not as popular as pre-vocational training as a lead-in to apprenticeship, VET in Schools, such as the *InStep* program in Western Australian schools, was generally looked on as a useful contribution to training in the electrotechnology industry. However, one contractor was disappointed at the standard of equipment used in schools for this training.

> VET in Schools has probably not been as successful as the pre-vocational training that is offered. … but I'm sure it complements the pre-vocational courses. I think it is worthwhile. Teaching electrical skills in schools is a bit of a problem, it's why it is mainly the underpinning stuff such as the OH&S and hand-tool skills that is taught there.
>
> Small electrical contractor

> VET in schools certainly offers students an advantage. However I have visited some schools recently and looked at their technical workshops. Much of their equipment is very antiquated, for example, for teaching CAD programs. They are trying to teach with outdated training facilities.
>
> Very large industry/commercial/domestic contractor

Paying for the training

In many cases the employer paid for training of employees, and it was undertaken in company time, particularly where it related directly to their job role.

One employer had an arrangement in which at least one approved course per year was undertaken as part of the enterprise agreement and training participation was a 50/50 split between company time and individual time.

If the training is undertaken by the employee after hours, then any sharing of training costs between the employee and employer is often negotiated; for instance, on the basis of how much benefit the training provides to the employee and how much to the employer. Employers often gave time off from working hours if the course was appropriate to their needs.

A substantial component of the training was subsidised through a Building and Construction Industry levy, administered by the Building and Construction Industry Training Board. Employers apply to the board for any subsidies they want for training. In the words of one small electrical contractor *That goes a long way towards paying for the training.*

One company that was quite active in training its employees stated that, because of all the red tape involved in accessing government training incentives, it did not access any government funding for training other than, by default, government incentives for apprentice training.

> I'm very supportive of the government and what they do [in regard to funding incentives for training] but having said that, it is too time-consuming. You don't know where to start, often there are forms upon forms upon forms upon forms—it's too hard, haven't got enough time.
>
> Large industrial/commercial/domestic electrical contractor

Although almost all contractors provided at least some financial support for training their employees, few actually budgeted for it. One looked at this approach in a positive light, saying that *training was not constrained by a budget*. Very few worked to a calendar of set training activity, most following a *just-in-time* approach and choosing to respond reactively rather than proactively to needs.

Drivers of training

By far the most frequently cited drivers of training were:

- ✧ Licensing, regulation, and compliance with statutory and legal requirements
- ✧ New developments in technology (particularly in the communications area)
- ✧ Mandatory occupational health and safety requirements
- ✧ Wiring rules updates

Others included:

- ✧ Ability of company to react to changing market and client demands
- ✧ Work procedures
- ✧ Commissioning/testing category 6 cabling
- ✧ Home/building automation

> Automation and other new technologies will drive training demand over the next 12 months. We will need to cross-train both electrical and communications people to ensure efficiencies can be applied in house wiring and testing. Medium-sized electrical contractor

In speaking of legislation as a driver of training, one contractor was critical of the fact that it was the employer who would have to pay for the training of employees in the identification and handling of asbestos.

> The government has passed legislation on asbestos. Now, our young people can't recognise asbestos, they wouldn't know what asbestos looks or smells like. They now have to be trained. Who's paying? Me. I've got to pay for their time to go and do the course. I've got to pay to see them accredited—to deal with something the government thinks we should know about. We should be entitled to a rebate on that training, covering the cost of the wages we have spent [three hours for each employee who attends the course].
>
> Regional electrical/communications contractor

Related to drivers of training, one contractor commented that the industry was still endeavouring to address an issue in which loopholes in the legislation still allowed unlicensed *trades assistants* to perform some types of electrical work.

Although quality assurance was specifically raised by interviewers as a possible driver of training, no contractors saw it as an important factor.

Triggers of training

Contractors were asked to identify any triggers they felt would induce employers and employees to undertake training. They cited:

- ✧ Legislative and compliance changes
- ✧ Adoption of a long-term commercial view—short-term cost versus long-term gain

> Triggers are related to the culture and philosophy of the organisation and how forward looking you are—it's something you do. Medium electrical and data communications

One company spoke of schemes designed to measure and recognise a company's participation in training as a means of encouraging training. As an example he cited one such scheme that has already begun to take shape in New South Wales.

> The triggers needed to increase the amount of training are, first, to make it worth the company's while—not necessarily for money. Instead it could be through a grading based on an audit asking: What are you doing to help your people? What are you doing to improve industry and opportunities? How many apprentices have you got? How many people did you

> train last year? New South Wales has gone some of the way because they are saying if you have got apprentices, if you go into courses, then you are going to get points. Now continuing professional development (CPD) is a factor. Maybe government and general tenders need to look at the CPD rating or something along that line and say what did you score? New South Wales has done it, Australian Capital Territory has rejected it, Queensland is looking at it. So there seems to be a shift of emphasis away from quality assurance in favour of making sure businesses are doing something to stay up with their industry and update their skill base. From our perspective the issue is 'make it worth my while as a business, don't hurt me, don't disadvantage me in the market place, help me be a good provider of services, and help me improve my people'. Regional electrical/communications contractor

Another company, thinking along similar lines, suggested that the industry adopt a continuous professional development program, similar to those operating in other industry sectors, which requires practitioners to accrue a minimum number of professional development points each year in order to retain their licences.

Satisfaction with existing systems of training

Despite their numerous criticisms and suggestions, most contractors, overall, were reasonably satisfied with the systems of training currently available to them, including pre-vocational, apprenticeship, and technical skills training.

> I am generally happy with the training. I think the industry provider certainly keeps up with industry trends. Our industry is highly regulated so the training has to be a set regime. The training is continually changing and evolving, it does lag a bit but that is a regulatory issue. Large commercial electrical/communications contractor

Some commented that provision could be more flexible to fit in with their work flow and busy times. Another was concerned that apprentices who employers deemed satisfactory on the job were being failed in their licensing test.

> There appears to be something wrong with the system when apprentices [whose on-job work is satisfactory] are continually failing final assessment on licensing. Either …the licensing authority has set too high a standard or the training provider is not training apprentices to the required standard. Commercial electrical contractor

Some respondents indicated they would like to deal with training issues and their training budget in a more organised, forward-thinking way.

Barriers to training

The main barriers to training identified by contractors are listed below, the most frequently cited being listed at the top.

- ✧ Cost
- ✧ Time
- ✧ Shortage of skilled workers to cover for others on training
- ✧ Willingness to participate in further skill development
- ✧ Industrial relations
- ✧ Access
- ✧ Lack of recognition of training undertaken by other training providers (particularly for wiring courses)
- ✧ Industry resistance to change (industry as a whole resists the notion of new skills, new technologies and new work practices)

- ✧ Lack of focus on basic skills as a critical element of a competent tradesperson (brought about by easy *over the counter* products and systems that are simply installed, tested and signed off).

Some of these are discussed in more detail below.

Cost

The cost of training was frequently cited by contractors as a barrier to training. This cost can be broken down into two components: the cost of the course and the cost in terms of working hours lost if undertaken in work time. If the employer determines that the course is beneficial to the company, he/she may elect to meet all or part of the course cost on behalf of the employee and may also be willing to absorb all or part the cost of working hours lost if the employee attends the course in working hours. Many employers spoke of negotiated arrangements in which, for instance, the employer may allow time off from work to do the course, provided the employee is prepared to spend an equal amount of time attending the course in his/her own time.

Many employers felt that the government subsidies for training were insufficient.

Scheduling of training

Even where employers are keen to support training and their employees are keen to pursue it, their good will and enthusiasm can be stifled by restrictions on the times that the courses are offered.

> Time is always an issue. Most of the training is during normal working hours which is difficult to accommodate when you have got deadlines and programs of work to be completed. If courses were on weekends and nights people may be more prepared to do some of the training. They have done that in the communications area, running courses on a Friday and a Saturday, and we go to our people saying, if you're prepared to put in a Saturday we'll put in the Friday. Medium commercial electrical/communications contractor

Shortage of skilled workers

To many employers, a significant obstacle to supporting employees in their desire to undertake training was often the lack of a spare worker to cover for the absence of the employee who is training—a problem exacerbated by the shortage of skilled tradesmen in the industry.

> The shortage of tradespeople means we are trying to get work done out there with a minimal number of people which makes it hard to spare them for training. For example we have got three people now doing Cert IV in Business management. One of them is my service manager, one the major project manager, and one is a leading hand. They are going to be away 2 days a fortnight for nearly five months. That puts a huge strain on us. If I had an adequate workforce then we wouldn't notice it as much.
>
> Large commercial/light industrial electrical contractor

> Because we can't get the labour, we need all of our people in the field so we find it difficult to give an employee a week off for training.
>
> Large commercial electrical/communications contractor

Lack of employee interest in improving their skills and levels

There were mixed feelings amongst contractors interviewed concerning willingness to train. Some said that employees generally were unenthusiastic about training, others that younger employees were not interested in furthering their careers, and still others who said that older employees who were more fixed in their ways were reluctant to undertake training.

> Look, I can't even get people to do First Aid courses. They won't go in [working hours] or in their own time with the company paying for their course … Effectively, the training does not cost the employee anything [but] if I don't pay for it they don't do it—the employee is not interested in improving himself at his own cost. I've only had one employee seek to do a course in recent times (a computer course), but that's a rarity. Most of them are standing back waiting for training to be handed out. Regional electrical/communications contractor

> Extra skills and extra effort should be rewarded but our company feels constrained about how it can provide this reward. Why bother with extra training when unsupportive people benefit from the efforts of a few? Metropolitan electrical contractor

> Age also has something to do with it, the older people are, the more staid they are in their ways—people who are approaching retirement are not interested in training. The ones who are most passionate about training are the young apprentices.
> Large industrial/commercial/domestic electrical contractor

Lack of employer interest in improving employees' skills and levels

As some respondents pointed out, there are many companies in the industry that provide little or no training for their employees, relying on other employers to do the training and leaving it to the individual to pursue training of their own accord.

> I recently employed somebody who came to me with a ten year history with another organisation. When I asked him what training courses he had done the answer was 'nothing'. Ten years, walks away and still just a dumb electrician. Not even a first aid course, no OH&S, nothing. I was shocked. I'll be honest and say to you, if as an industry, we don't give these people a little more value and give them opportunity and growth, and a career path, they will have little respect for the industry and their employers. On average our employees are doing an average of 46 hours a week, a lot of them working Saturdays and evenings—we are taking a big lump of their lives. I think we owe them something—I'm being pragmatic, I think we need to invest in these people, otherwise I don't know how we are going to keep them interested. Regional electrical/communications contractor

Insufficient financial assistance for mature-aged apprentices

It is generally recognised that mature-aged apprentices, because of their more stable lifestyle and family and financial commitments, are more likely to complete an apprenticeship and stay on in the industry than many of the younger apprentices. In the opinion of some contractors, the government is not doing enough to support these good prospects for trade training.

> The government is not doing enough to assist mature-age apprentices. There should be an avenue where if a mature-age apprentice can prove they have been on an income of say $40,000 there should be some sort of assistance [at a level] that would help them get through financially. We are helping them a little bit but I think the government should do a lot more.
> Very large industry/commercial/domestic contractor

Communications training offerings are unnecessarily complex

Australian Communications Authority (ACA) training has become more onerous in recent years. Courses have increased in length and complexity, covering new technology such as fibre-optics, and vendors are increasingly providing specialised training for accreditation to work solely on their own products.

> The trouble with communications is they have made it into something it wasn't. Each vendor is promoting their product as something different and better and specifying procedures differently from their competitors and requiring accreditation and certification (over and above ACA licensing) in order to work on it. This is tending to make it all a lot more complex than it actually is. Regional electrical/communications contractor

Strategies and training plans for the future

Data Trak training scheme

The following extract from the NECA National Newsletter, July 2005 describes a training scheme which assists school leavers to complete a substantial amount of training in communications during Years 11 and 12, so enabling them to acquire substantial qualifications in communications prior to entering the industry upon leaving school.

> NECA (SA) in conjunction with the Australian Science and Maths School, the RTO PEER TEC, and the SA Department of Education and Children's Services have just recently launched a joint pilot program for a 'first-ever' School-based New Apprenticeship Scheme in Electrotechnology – Data communications which is being offered to Years 11 and 12 secondary school students in SA … Called 'Data Trak' the new apprenticeship will enable students to complete their normal school based secondary education certificate (SACE) in Years 11 and 12 while simultaneously engaging under a Contract of Training to obtain a Certificate II in Electrotechnology – Data communications … Students undertake work and study cycles over a two year period including 8 weeks at secondary school doing SACE work four days per week and one day in vocational education, and four weeks full time work in data cabling, while being paid. At the conclusion of the two year program, successful students will have SACE Certificates I and II, a certificate in Electrotechnology – Data communications, Cisco accreditation in IT, and Australian Communications Authority cabler accreditation. *NECA National Newsletter*, July 2005

Technical colleges

All contractors appeared to be strongly supportive of the proposed new technical colleges. From their comments it appears that technical colleges have considerable potential to make apprenticeship an attractive option for employers.

> I think they will work well in some areas—where you have the student still doing his school study but at the same time he is learning a trade and getting paid for it. I think it will make the apprentice more motivated and more serious about the trade. If a young person is going to take that step they are probably going to go all the way. Also, the employers will have some say on what the training will be and it will be a win-win situation. Small electrical contractor

> In theory I think it [technical colleges] is fantastic, but in practice I think the government has set itself a timetable that will be difficult to achieve … I like the idea, I think employers will take it up. Large commercial electrical/communications contractor

> The introduction of technical colleges is the very best thing they can do now, without a doubt. The day they dropped [technical high schools] they made the biggest mistake ever. Large commercial/light industrial contractor

> These new [technical] colleges will be interesting … If they do Year 11 or 12, we can expect that they will be able to [complete] at least one year of their theory before they hit the job running. What we are saying is that they could finish their theoretical work in a year and a half of their four year term, and would work full-time for their company from then on out. So the company gets a bigger return for a smaller investment up front. It makes the apprentice more attractive to employers because you are not losing an employee for one day a week for three years, but only one day a week for a year and a half. We still believe they need the physical experience in industry and that takes years not months—we are not talking about shortening the on-the-job component just simplifying the in-classroom stuff. Given that there is so much to be learned these days, I don't even think that four years is enough. Regional electrical/communications contractor

Training that is needed

One contractor commented that there was a need for courses in business management and leadership skills that were specifically targeted to the electrical industry. This contractor also noted that the generic courses currently available were not as attractive because they lacked relevance.

Support for employers who train

The provision of support and recognition for those employers who do provide training opportunities for their staff was seen as important, particularly incentives for small business employers.

Closer relationships between employers and regulators re licensing

A closer cooperative relationship between employers and the regulator in relation to licensing issues was also suggested as a strategy that could improve standards and contribute to better training.

Key findings from the interviews

The views of contractors, vendors and training providers interviewed for this study suggested that:

- Technological change is leading to a merging of technologies in the industry, which demands that key workers (technicians) have knowledge and skills both in electrical and data communications. To achieve this combination of skills, the preferred option is to recruit qualified electricians, and train them in data communications.
- Technological change has led to an increased demand for high-level workers capable of planning, installing, configuring and troubleshooting installations. As well, there is an increasing demand for workers to have IT skills for computer communication from the worksite.
- Due to the pace of technological change, traditional industry trainers such as TAFE are finding it increasingly difficult to provide up-to-date and specialised training to enable contracting employees to work with new products.
- Training packages may need to be altered in concept to take greater account of merging technologies.
- Vendors have been increasingly providing training on their own products. Much of this training is non-accredited and focused specifically on the vendor's products.
- Collaboration between vendors and TAFE was generally seen to have potential benefits—both for vendors and TAFE. However, if TAFE is to capitalise on its assets, particularly its national coverage, it will need to present a more unified image, both within the states and territories and nationally.
- Skills shortages exist across the board in the electrical area.
- Skills shortages are linked to the performance of the wider building industry, the local economy and geographic location. They may be short-term due to the slowing of the building industry.
- Skills shortages are affecting the ability of some contractors to expand and tender for new projects.
- Contractors supported and used VET in Schools and pre-vocational programs as a means for recruiting good-quality candidates for apprenticeship. Relationships with TAFE institutions and group training companies were also used to find skilled personnel, as was word of mouth through the industry. Use of recruitment agencies was mainly confined to higher-level (e.g. supervisory and management) staff.
- Contractors are generally happy with the training system; however, they would like to see some changes to the apprenticeship system and training provision, including the provision of more relevant higher-level (post-trade) courses.
- Key drivers of training were licensing, regulation, statutory and legal compliance requirements, new developments in technology, and mandatory occupational health and safety requirements.
- Main barriers to training were cost, scheduling of training and shortage of skilled workers to cover for those undertaking training.
- Contractors would like training to support further expansion of knowledge and skills related to new technologies. Training needs to support business growth and objectives.

References

ABS (Australian Bureau of Statistics) 1993, *Australian and New Zealand Standard Industrial Classification*, ABS, Canberra.

——1997, *Australian Standard Classification of Occupations (ASCO2)*, ABS, Canberra.

ANTA (Australian National Training Authority) 2005, *Industry skills report*, ANTA, Brisbane.

Australian Industry Group 2005a, *Contemporary apprenticeships for the twenty-first century*, viewed 2 November 2005, <http://www.aigroup.asn.au/scripts/cgiip.exe/WService=aigroup/ccms.r?pageID=963>.

——2005b, *Making the economy work better: A model for contemporary apprenticeships*, viewed 2 November 2005, <http://www.aigroup.asn.au/scripts/cgiip.exe/WService=aigroup/ccms.r?pageID=963>.

DEWR (Department of Employment and Workplace Relations) 2005, *JobSearch vacancies*, September, DEWR, Canberra.

Houghton, JW & Morris, P 2003, *National Electrical and Communications Association industry study*, report to NECA, Centre for Strategic Economic Studies, Melbourne.

NCVER (National Centre for Vocational Education Research) 2000, *Evidence of skill shortages in the electrotechnology trades*, NCVER, Adelaide. [Attachment to *Skill shortages in electrotechnology*, Electrotechnology Working Group, <http://www.skillsinitiative.gov.au/documents/working_group/electrotechnolgy.pdf> (note the spelling: 'electrotechnolgy')].

——2002, *Employer engagement with new apprenticeships in the electrotechnology industry*, NCVER, Adelaide.

NECA (National Electrical and Communications Association) 2002, *Skills shortages in electrotechnology, Final progress report*, produced by the Electrotechnology Task Force, NECA, Melbourne.

Waterhouse, P, Virgona, C & Brown, R forthcoming, *Local governments facilitating learning and development through partnerships*, NCVER, Adelaide.

Appendix A: Data scope

Table A1: Industries for inclusion in the analysis of the electrical and communications industry workforce, Australian and New Zealand Standard Industrial Classification (ANZSIC: 1993)

ANZSIC code	Industry descriptor
DIVISION C	**MANUFACTURING**
SUBDIVISION 28	**MACHINERY AND EQUIPMENT MANUFACTURING**
284	*Electronic Equipment Manufacturing*
2842	Telecommunication, Broadcasting and Transceiving Equipment Manufacturing
2849	Electronic Equipment Manufacturing nec
285	*Electrical Equipment and Appliance Manufacturing*
2852	Electric Cable and Wire Manufacturing
2859	Electrical and Equipment Manufacturing nec
286	*Machinery and Equipment Manufacturing*
2865	Lifting and Material Handling Equipment Manufacturing [including: Elevator installation; Elevator or elevator parts mfg; Escalator Installation; Escalators or escalator parts mfg]
DIVISION E	**CONSTRUCTION**
SUBDIVISION 41	**GENERAL CONSTRUCTION**
411	*Building Construction*
4112	Residential Building Construction nec
4113	Non-Residential [Commercial] Building Construction
412	*Non-Building Construction*
4122	Non-Building Construction nec
SUBDIVISION 42	**CONSTRUCTION TRADE SERVICES**
423	*Installation Trade Services*
4232	Electrical Services
4233	Air Conditioning and Heating Services
4234	Fire and Security System Services

Note: nec = nowhere else classified.
Source: ABS (1993)

Table A2: Occupation sub-divisions for inclusion in the analysis of the electrical and communications industry workforce, Australian Standard Classification of Occupations (ASCO2)

ASCO2 code	Occupation descriptor
MAJOR 3	**ASSOCIATE PROFESSIONALS**
SUB-MAJOR 31	**SCIENCE, ENGINEERING AND RELATED ASSOCIATE PROFESSIONALS**
312	*Building and Engineering Associate Professionals*
3123	Electrical Engineering Associate Professionals
3124	Electronic Engineering Associate Professionals
MAJOR 4	**TRADESPERSONS AND RELATED WORKERS**
SUB-MAJOR 43	**ELECTRICAL AND ELECTRONICS TRADESPERSONS**
431	*Electrical and Electronics Tradespersons*
4311	Electricians
4312	Refrigeration and Airconditioning Mechanics
4313	Electrical Distribution Tradespersons
4314	Electronic Instrument Tradespersons
4315	Electronic and Office Equipment Tradespersons
4316	Communications Tradespersons
MAJOR 9	**LABOURERS AND RELATED WORKERS**
SUB-MAJOR 99	**OTHER LABOURERS AND RELATED WORKERS**
991	*Mining, Construction and Related Labourers*
9918	Electrical and Telecommunications Trades Assistants

Source: ABS (1997)

Table A3: Hierarchy of identified electrical and communications occupations (ASCO2) by industry of employment (ANZSIC) for employed persons, Australia

Occupation (ASCO2)	Industry of employment (ANZSIC)											
	2842 Telecommunication, Broadcasting & Transceiving Equipment Manufacturing	2849 Electronic Equipment Manufacturing, nec	2852 Electric Cable & Wire Manufacturing	2859 Electrical & Equipment Manufacturing, nec	2865 Lifting & Material Handling Equipment Manufacturing	4112 Residential Building Construction, nec	4113 Non-Residential Building Construction	4122 Non-Building Construction, nec	4232 Electrical Services	4233 Air Conditioning & Heating Services	4234 Fire & Security System Services	**Total**
3123 Electrical Engineering Associate Professionals	113	56	12	112	34	3	3	94	732	29	58	**1,246**
3124 Electronics Engineering Associate Professionals	293	557	42	79	10	3	6	96	336	9	156	**1,587**
4311 Electricians	901	230	133	1,281	1,872	38	217	839	37,266	758	603	**44,138**
4312 Refrigeration & Airconditioning Mechanics	0	3	0	3	0	5	26	30	141	6,452	4	**6,664**
4313 Electrical Distribution Tradespersons	3	4	15	7	3	0	3	360	342	0	3	**740**
4314 Electronic Instrument Tradespersons	8	30	3	8	0	0	0	3	13	0	20	**85**
4315 Electronic & Office Equipment Tradespersons	67	569	14	22	9	0	3	52	266	15	1,468	**2,485**
4316 Communications Tradespersons	216	29	166	10	0	3	4	718	280	0	43	**1,469**
9918 Electrical & Telecommunications Trades Assistants	32	4	10	53	6	0	3	45	811	14	11	**989**
Total	**1,633**	**1,482**	**395**	**1,575**	**1,934**	**52**	**265**	**2,237**	**40,187**	**7,277**	**2,366**	**59,403**

Note: nec = nowhere else classified.

Source: ABS Census of Population and Housing, 2001

Table A4: Employment in electrical and communications sub-sectors, by age and gender, August 2001

Industry	15–24	25–34	35–44	45–54	55–64	65+	Total
Male							
Manufacturing	**1,048**	**1,869**	**1,894**	**1,354**	**554**	**50**	**6,769**
Machinery and Equipment Manufacturing	*1,048*	*1,869*	*1,894*	*1,354*	*554*	*50*	***6,769***
Telecommunication, Broadcasting & Transceiving Equipment Manufacturing	229	434	448	338	121	9	**1,579**
Electronic Equipment Manufacturing, nec	223	391	363	272	112	15	**1,376**
Electric Cable & Wire Manufacturing	82	87	100	62	15	7	**353**
Electrical & Equipment Manufacturing, nec	294	351	390	318	165	16	**1,534**
Lifting & Material Handling Equipment Manufacturing	220	606	593	364	141	3	**1,927**
Construction	**11,354**	**13,973**	**13,095**	**9,315**	**3,439**	**505**	**51,681**
General Construction	*341*	*752*	*759*	*521*	*140*	*9*	***2,522***
Residential Building Construction, nec	9	17	12	9	4	0	**51**
Non-Residential Building Construction	51	84	63	51	13	0	**262**
Non-Building Construction, nec	281	651	684	461	123	9	**2,209**
Construction Trade Services	*11,013*	*13,221*	*12,336*	*8,794*	*3,299*	*496*	***49,159***
Electrical Services	8,696	10,463	9,869	7,350	2,779	441	**39,598**
Air Conditioning & Heating Services	1,843	1,984	1,817	1,127	408	47	**7,226**
Fire & Security System Services	474	774	650	317	112	8	**2,335**
Total male	**12,402**	**15,842**	**14,989**	**10,669**	**3,993**	**555**	**58,450**
% of males in electrical & communications sub-sectors	20.9	26.7	25.2	18.0	6.7	0.9	**98.4**
% males all industries	8.5	12.9	13.9	12.2	6.0	1.3	**54.8**
Female							
Manufacturing	**27**	**61**	**85**	**61**	**14**	**3**	**251**
Machinery and Equipment Manufacturing	*27*	*61*	*85*	*61*	*14*	*3*	***251***
Telecommunication, Broadcasting & Transceiving Equipment Manufacturing	6	14	21	10	3	0	**54**
Electronic Equipment Manufacturing, nec	6	29	38	27	5	0	**105**
Electric Cable & Wire Manufacturing	5	8	15	12	0	0	**40**
Electrical & Equipment Manufacturing, nec	5	6	11	12	6	3	**43**
Lifting & Material Handling Equipment Manufacturing	5	4	0	0	0	0	**9**
Construction	**80**	**142**	**229**	**160**	**83**	**14**	**708**
General Construction	*5*	*7*	*12*	*3*	*3*	*0*	***30***
Residential Building Construction, nec	0	0	0	0	0	0	**0**
Non-Residential Building Construction	0	0	0	0	0	0	**0**
Non-Building Construction, nec	5	7	12	3	3	0	**30**
Construction Trade Services	*75*	*135*	*217*	*157*	*80*	*14*	***678***
Electrical Services	56	110	188	147	74	14	**589**
Air Conditioning & Heating Services	15	14	16	7	3	0	**55**
Fire & Security System Services	4	11	13	3	3	0	**34**
Total female	**107**	**203**	**314**	**221**	**97**	**17**	**959**
% of females in electrical & communications sub-sectors	0.2	0.3	0.5	0.4	0.2	0.0	**1.6**
% females all industries	8.3	10.6	11.5	10.4	3.8	0.7	**45.2**
Total persons	**12,509**	**16,045**	**15,303**	**10,890**	**4,090**	**572**	**59,409**

Note: nec = nowhere else classified.

Source: ABS Census of Population and Housing, 2001

Table A5: Cumulative duration of employment in current occupation in current job in electrical and communications industry, by cumulative duration of employment in current job, employed persons aged 15–64 years, Australia, 2001

	Cumulative duration of employment in current occupation, weighted estimate ('000)							
	Electrotechnology(a)				All employed persons			
Cumulative duration of employment in current job	*under 3 years*	*3 <10 years*	*10 years or more*	*Total*	*under 3 years*	*3 <10 years*	*10 years or more*	***Total***
under 3 years	11.6	6.7	12.2	30.5	2,634.8	744.3	697.6	**4,076.8**
3 <10 years	2.7	15.3	13.6	31.6	312.5	1,809.5	735.9	**2,857.9**
10 years or more	1.2	1.6	14.4	17.3	120.8	303.3	1,843.7	**2,267.8**
Total	**15.5**	**23.7**	**40.3**	**79.4**	**3,068.2**	**2,857.0**	**3,277.2**	**9,202.5**

Appendix B: Training activity

Courses and qualifications

Training package qualifications categorised as forming part of the training activities of the electrical and communications industry were:

Electrotechnology

(UTE99) Electrotechnology industry

- UTE10102 Certificate I in Electrotechnology
- UTE10199 Certificate I in Electrotechnology (superseded by UTE10102)
- UTE10202 Certificate I in Sustainable Energy (Electrotechnology)
- UTE20199 Certificate II in Electrotechnology Business Support
- UTE20299 Certificate II in Electrotechnology Data Communications
- UTE20399 Certificate II in Electrotechnology Powerline (Vegetation Control)
- UTE20499 Certificate II in Electrotechnology Remote Area Essential Services Operations
- UTE20502 Certificate II in Electrotechnology Servicing (superseded by UTE20504)
- UTE20504 Certificate II in Electrotechnology Servicing
- UTE20599 Certificate II in Electrotechnology Servicing (superseded by UTE20502)
- UTE20604 Certificate II in Electrotechnology Technical Support
- UTE20699 Certificate II in Electrotechnology Technical Support (superseded by UTE20604)
- UTE30104 Certificate III in Electrotechnology Assembly and Servicing
- UTE30199 Certificate III in Electrotechnology Assembly and Servicing (superseded by UTE30104)
- UTE30299 Certificate III in Electrotechnology Building Services
- UTE30399 Certificate III in Electrotechnology Business Administration
- UTE30402 Certificate III in Electrotechnology Communications
- UTE30499 Certificate III in Electrotechnology Communications (superseded by UTE30402)
- UTE30599 Certificate III in Electrotechnology Computer Systems
- UTE30699 Certificate III in Electrotechnology Data Communications
- UTE30702 Certificate III in Electrotechnology Entertainment and Servicing
- UTE30799 Certificate III in Electrotechnology Entertainment and Servicing (superseded by UTE30702)
- UTE30899 Certificate III in Electrotechnology Instrumentation
- UTE30999 Certificate III in Electrotechnology Refrigeration and Air Conditioning
- UTE31099 Certificate III in Electrotechnology Scanning
- UTE31199 Certificate III in Electrotechnology Systems Electrician
- UTE40199 Certificate IV in Electrotechnology Apparatus Servicing
- UTE40302 Certificate IV in Electrotechnology Communications
- UTE40399 Certificate IV in Electrotechnology Communications (superseded by UTE40302)
- UTE40499 Certificate IV in Electrotechnology Computer Systems
- UTE40599 Certificate IV in Electrotechnology Contracting
- UTE40602 Certificate IV in Electrotechnology Entertainment and Servicing
- UTE40699 Certificate IV in Electrotechnology Entertainment and Servicing (superseded by UTE40602)
- UTE40799 Certificate IV in Electrotechnology Explosion-protection
- UTE40999 Certificate IV in Electrotechnology Instrumentation

- UTE41099 Certificate IV in Electrotechnology Radar Systems
- UTE41199 Certificate IV in Electrotechnology Refrigeration and Air Conditioning
- UTE41202 Certificate IV in Electrotechnology Systems Electrician
- UTE41299 Certificate IV in Electrotechnology Systems Electrician (superseded by UTE41202)
- UTE41301 Certificate IV in Electrotechnology Renewable Energy
- UTE50199 Diploma of Computer Systems Engineering
- UTE50299 Diploma of Electrical Engineering
- UTE50399 Diploma of Electronics Engineering
- UTE50499 Diploma of Instrumentation and Control Engineering
- UTE50599 Diploma of Refrigeration and Air Conditioning Engineering
- UTE50601 Diploma of Electrotechnology Renewable Energy
- UTE60199 Advanced Diploma of Computer Systems Engineering
- UTE60299 Advanced Diploma of Electrical Engineering
- UTE60399 Advanced Diploma of Electronics Engineering
- UTE60499 Advanced Diploma of Instrumentation and Control Engineering

Lifts industry

Training package qualifications which were included as forming part of the training activities of the electrical and communications industry include:

UTL98 Lifts Industry 04/12/1998 (electrical qualifications only)

- UTL30198 Certificate III in Lift Systems (Electrical)
- UTL40198 Certificate IV in Lift Systems (Electrical)

Qualification streams concerned with non-electrical maintenance and operational support within the lifts industry were excluded as out of scope of this report.

Telecommunications

Telecommunications Training Package ICT97 superseded by ICT02 on 30/09/2002

ICT02 Telecommunications 30/09/2002

Technical

- ICT20202 Certificate II in Telecommunications
- ICT20302 Certificate II in Telecommunications Cabling
- ICT20402 Certificate II in Telecommunications Access Network
- ICT30202 Certificate III in Telecommunications
- ICT30302 Certificate III in Telecommunications Cabling and Customer Premises Equipment
- ICT40202 Certificate IV in Telecommunications Engineering
- ICT40302 Certificate IV in Telecommunications Computer Systems
- ICT40402 Certificate IV in Telecommunications Network Planning
- ICT50202 Diploma of Telecommunications Engineering
- ICT50302 Diploma of Telecommunications Computer Systems
- ICT50402 Diploma of Telecommunications Photonics
- ICT60202 Advanced Diploma of Telecommunications Engineering
- ICT60302 Advanced Diploma of Telecommunications Computer Systems

ICT97 Telecommunications (superseded by ICT02) 23/09/1997

Cabling

- ICT20297 Certificate II in Telecommunications (Cabling)
- ICT30497 Certificate III in Telecommunications (Cabling)
- ICT40499 Certificate IV in Telecommunications (Cabling)

Customer Access Network (CAN)

- ICT20399 Certificate II in Telecommunications (CAN)
- ICT30397 Certificate III in Telecommunications (CAN)
- ICT40397 Certificate IV in Telecommunications (CAN)
- ICT50399 Diploma of Telecommunications (CAN)

Customer Premises and Equipment (CPE)

- ICT30297 Certificate III in Telecommunications (CPE)
- ICT40297 Certificate IV in Telecommunications (CPE)
- ICT50299 Diploma of Telecommunications (CPE)

Customer Premises, Cabling and Equipment

- ICT30699 Certificate III in Telecommunications (Customer Premises, Cabling and Equipment)

Engineering

- ICT50197 Diploma of Telecommunications Engineering
- ICT60197 Advanced Diploma of Telecommunications Engineering

Telecommunications

- ICT20197 Certificate II in Telecommunications
- ICT30197 Certificate III in Telecommunications
- ICT40197 Certificate IV in Telecommunications

Table A6: Apprentice and trainee commencements, 12 months to December 1999 to 2004 and March 2005 quarter by selected training packages, Australia

Training package qualification	1999	2000	2001	2002	2003	2004	March 2005 quarter
UTE99 Electrotechnology Industry (all)							
UTE10199 – Certificate I in Electrotechnology (superseded by UTE10102)	1	0	0	0	0	0	0
UTE20199 – Certificate II in Electrotechnology Business Support	1	20	4	3	2	0	0
UTE20299 – Certificate II in Electrotechnology Data Communications	0	7	9	2	3	11	18
UTE20399 – Certificate II in Electrotechnology Powerline (Vegetation Control)	0	0	1	0	0	0	3
UTE20499 – Certificate II in Electrotechnology Remote Area Essential Services Operations	0	1	39	5	59	26	0
UTE20502 – Certificate II in Electrotechnology Servicing	0	0	0	3	89	94	43
UTE20504 – Certificate II in Electrotechnology Servicing	0	0	0	0	0	3	14
UTE20599 – Certificate II in Electrotechnology Servicing (superseded by UTE20502)	3	126	172	169	143	80	27
UTE20699 – Certificate II in Electrotechnology Technical Support	0	3	4	0	2	0	0
UTE30104 – Certificate III in Electrotechnology Assembly & Servicing	0	0	0	0	0	10	32
UTE30199 – Certificate III in Electrotechnology Assembly & Servicing	10	80	100	101	128	102	35
UTE30299 – Certificate III in Electrotechnology Building Services	6	50	50	22	39	54	18
UTE30402 – Certificate III in Electrotechnology Communications	0	1	0	1	1	36	28
UTE30499 – Certificate III in Electrotechnology Communications (superseded by UTE30402)	3	28	50	74	118	82	15
UTE30599 – Certificate III in Electrotechnology Computer Systems	3	26	52	44	46	40	17
UTE30699 – Certificate III in Electrotechnology Data Communications	17	59	34	45	32	24	19
UTE30702 – Certificate III in Electrotechnology Entertainment & Servicing	0	0	1	2	2	25	35
UTE30799 – Certificate III in Electrotechnology Entertainment & Servicing (superseded by UTE30702)	12	72	119	94	81	55	5
UTE30899 – Certificate III in Electrotechnology Instrumentation	3	28	76	50	49	69	43
UTE30999 – Certificate III in Electrotechnology Refrigeration & Air Conditioning	84	295	457	491	637	909	487
UTE31099 – Certificate III in Electrotechnology Scanning	0	2	1	3	1	0	0
UTE31199 – Certificate III in Electrotechnology Systems Electrician	218	1,290	2,320	4,083	4,842	6,064	3,225
UTE40199 – Certificate IV in Electrotechnology Apparatus Servicing	0	2	0	0	0	0	0
UTE40302 – Certificate IV in Electrotechnology Communications	0	0	0	0	0	1	0
UTE40499 – Certificate IV in Electrotechnology Computer Systems	0	4	1	11	0	0	0
UTE40699 – Certificate IV in Electrotechnology Entertainment & Servicing (superseded by UTE40602)	1	3	6	3	0	0	0
UTE40999 – Certificate IV in Electrotechnology Instrumentation	1	6	6	0	2	8	0

Training package qualification	1999	2000	2001	2002	2003	2004	March 2005 quarter
UTE41199 – Certificate IV in Electrotechnology Refrigeration & Air Conditioning	7	11	26	14	9	2	3
UTE41299 – Certificate IV in Electrotechnology Systems Electrician (superseded by UTE41202)	9	26	14	13	13	7	0
Subtotal – Electrotechnology	*379*	*2,140*	*3,542*	*5,233*	*6,298*	*7,703*	*4,066*
ICT02 and ICT97 Telecommunications (technical qualifications)							
ICT20197 – Certificate II in Telecommunications	64	24	33	32	32	26	0
ICT20202 – Certificate II in Telecommunications	0	0	0	0	15	78	91
ICT20297 – Certificate II in Telecommunications (Cabling)	188	86	43	38	31	14	1
ICT20302 – Certificate II in Telecommunications Cabling	0	0	0	0	2	127	29
ICT20399 – Certificate II in Telecommunications (CAN)	0	0	4	4	2	0	0
ICT30197 – Certificate III in Telecommunications	65	65	20	22	6	2	0
ICT30202 – Certificate III in Telecommunications	0	0	0	0	14	29	21
ICT30297 – Certificate III in Telecommunications (CPE)	0	0	2	1	0	0	0
ICT30302 – Certificate III in Telecommunications Cabling & Customer Premises Equipment	0	0	0	0	0	10	7
ICT30397 – Certificate III in Telecommunications (CAN)	22	1	11	2	1	0	0
ICT30497 – Certificate III in Telecommunications (Cabling)	5	13	19	23	15	4	1
ICT30699 – Certificate III in Telecommunications (Customer Premises, Cabling & Equipment)	0	1	2	1	1	0	0
ICT40197 – Certificate IV in Telecommunications	4	12	0	15	6	0	0
ICT40202 – Certificate IV in Telecommunications Engineering	0	0	0	0	0	7	1
ICT40499 – Certificate IV in Telecommunications (Cabling)	0	0	0	0	2	0	0
ICT50197 – Diploma of Telecommunications Engineering	0	55	0	0	0	0	0
Subtotal – Telecommunications	*348*	*257*	*134*	*138*	*127*	*298*	*152*
UTL98 Lifts Industry (electrical qualifications)							
UTL30198 – Certificate III in Lift Systems (Electrical)	8	17	17	25	8	1	3
Subtotal – Lifts Industry	*8*	*17*	*17*	*25*	*8*	*1*	*3*
Total	**735**	**2,414**	**3,693**	**5,396**	**6,433**	**8,002**	**4,221**

Note: Based on June 2005 estimates.

Source: NCVER, unpublished statistics

Table A7: Apprentice and trainee commencements, 12 months to December 2004 by selected training packages by age, Australia

AQF Level	Age 14 or less	15–19	20–24	25–34	35–44	45–54	55–64	65 and over	Total
ICT									
Certificate II	1	110	84	35	11	4	0	0	**245**
Certificate III	0	20	18	5	1	1	0	0	**46**
Certificate IV	0	3	2	2	0	0	0	0	**7**
Total	**1**	**133**	**104**	**42**	**12**	**5**	**0**	**0**	**298**
UTE									
Certificate II	1	104	61	30	12	5	1	0	**214**
Certificate III	1	5,065	1,415	723	209	54	4	0	**7,471**
Certificate IV	0	15	2	1	0	0	0	0	**18**
Total	**2**	**5,184**	**1,478**	**754**	**221**	**59**	**5**	**0**	**7,703**
UTL									
Certificate III	0	0	0	1	0	0	0	0	**1**
Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
Total electrocomms									
Certificate II	2	214	145	65	23	9	1	0	**459**
Certificate III	1	5,085	1,433	729	210	55	4	0	**7,518**
Certificate IV	0	18	4	3	0	0	0	0	**25**
Total	**3**	**5,317**	**1,582**	**797**	**233**	**64**	**5**	**0**	**8,002**

Note: Based on June 2005 estimates.

Table A8: Vocational course enrolments (in-training) in selected training packages for Australia, 1999–2004

Training package qualification	1999	2000	2001	2002	2003	2004
UTE99 Electrotechnology Industry (all)						
UTE99 Electro-technology Industry (all qualifications)						
UTE10102 Certificate I in Electro-technology	0	0	0	0	13	996
UTE10199 Certificate I in Electro-technology (superseded by UTE10102)	0	61	215	515	638	571
UTE10202 Certificate I in Sustainable Energy (Electro-technology)	0	0	0	0	0	0
UTE20199 Certificate II in Electro-technology Business Support	0	11	21	0	0	0
UTE20299 Certificate II in Electro-technology Data Communications	0	1	10	2	0	17
UTE20399 Certificate II in Electro-technology Powerline (Vegetation Control)	0	0	69	35	47	10
UTE20499 Certificate II in Electro-technology Remote Area Essential Services Operations	0	0	3	7	15	77
UTE20502 Certificate II in Electro-technology Servicing (superseded by UTE20504)	0	0	0	0	10	163
UTE20504 Certificate II in Electro-technology Servicing	0	0	0	0	0	60
UTE20599 Certificate II in Electro-technology Servicing (superseded by UTE20502)	25	124	312	349	374	462
UTE20604 Certificate II in Electro-technology Technical Support	0	0	0	0	0	0
UTE20699 Certificate II in Electro-technology Technical Support (superseded by UTE20604)	0	0	0	0	1	1
UTE30104 Certificate III in Electro-technology Assembly & Servicing	0	0	0	0	0	2
UTE30199 Certificate III in Electro-technology Assembly & Servicing (superseded by UTE30104)	0	3	31	98	200	239
UTE30299 Certificate III in Electro-technology Building Services	0	0	2	21	39	67
UTE30399 Certificate III in Electro-technology Business Administration	0	0	0	0	0	0
UTE30402 Certificate III in Electro-technology Communications	0	0	0	0	0	7
UTE30499 Certificate III in Electro-technology Communications (Superseded by UTE30402)	0	2	85	153	230	205
UTE30599 Certificate III in Electro-technology Computer Systems	0	90	210	256	158	207
UTE30699 Certificate III in Electro-technology Data Communications	14	50	78	95	83	81
UTE30702 Certificate III in Electro-technology Entertainment & Servicing	0	0	0	0	0	26
UTE30799 Certificate III in Electro-technology Entertainment & Servicing (superseded by UTE30702)	0	227	441	511	321	237
UTE30899 Certificate III in Electro-technology Instrumentation	0	1	81	78	91	235
UTE30999 Certificate III in Electro-technology Refrigeration & Air Conditioning	0	555	1,032	1,440	1,736	2,041
UTE31099 Certificate III in Electro-technology Scanning	0	0	0	0	0	0
UTE31199 Certificate III in Electro-technology Systems Electrician	41	1,960	4,280	7,090	10,689	14,218
UTE40199 Certificate IV in Electro-technology Apparatus Servicing	0	0	0	0	0	0
UTE40302 Certificate IV in Electro-technology Communications	0	0	0	0	0	0
UTE40399 Certificate IV in Electro-technology Communications (Superseded by UTE40302)	0	0	0	0	50	0
UTE40499 Certificate IV in Electro-technology Computer Systems	0	11	42	36	16	86
UTE40599 Certificate IV in Electro-technology Contracting	0	0	0	30	168	262
UTE40602 Certificate IV in Electro-technology Entertainment & Servicing	0	0	0	0	0	0
UTE40699 Certificate IV in Electro-technology Entertainment & Servicing (superseded by UTE40602)	0	0	0	0	0	7
UTE40799 Certificate IV in Electro-technology Explosion-protection	0	0	0	0	0	0
UTE40999 Certificate IV in Electro-technology Instrumentation	0	0	3	2	3	16
UTE41099 Certificate IV in Electro-technology Radar Systems	0	0	0	0	0	0
UTE41199 Certificate IV in Electro-technology Refrigeration & Air	0	0	0	0	0	0

Training package qualification	1999	2000	2001	2002	2003	2004
Conditioning						
UTE41202 Certificate IV in Electro-technology Systems Electrician	0	0	0	0	0	113
UTE41299 Certificate IV in Electro-technology Systems Electrician (superseded by UTE41202)	0	0	60	130	145	61
UTE41301 Certificate IV in Electro-technology Renewable Energy	0	0	0	0	0	71
UTE50199 Diploma of Computer Systems Engineering	0	7	0	0	0	41
UTE50299 Diploma of Electrical Engineering	0	0	4	32	42	28
UTE50399 Diploma of Electronics Engineering	0	0	1	0	48	2
UTE50499 Diploma of Instrumentation & Control Engineering	0	0	0	0	0	0
UTE50599 Diploma of Refrigeration & Air Conditioning Engineering	0	0	0	0	0	0
UTE50601 Diploma of Electro-technology Renewable Energy	0	0	0	0	0	17
UTE60199 Advanced Diploma of Computer Systems Engineering	0	0	60	2,072	2,279	2,128
UTE60299 Advanced Diploma of Electrical Engineering	0	0	0	5	30	137
UTE60399 Advanced Diploma of Electronics Engineering	0	0	37	574	1,029	1,092
UTE60499 Advanced Diploma of Instrumentation & Control Engineering	0	0	0	0	0	0
Subtotal – Electrotechnology	*80*	*3,103*	*7,077*	*13,531*	*18,455*	*23,983*
ICT02 & ICT97 Telecommunications (technical qualifications)						
ICT20197 Certificate II in Telecommunications	64	36	290	373	376	242
ICT20202 Certificate II in Telecommunications	0	0	0	0	11	200
ICT20297 Certificate II in Telecommunications (Cabling)	162	419	721	608	840	302
ICT20302 Certificate II in Telecommunications Cabling	0	0	0	0	0	205
ICT20399 Certificate II in Telecommunications (CAN)	1	0	100	59	38	1
ICT20402 Certificate II in Telecommunications Access Network	0	0	0	0	0	0
ICT30197 Certificate III in Telecommunications	0	96	104	507	627	157
ICT30202 Certificate III in Telecommunications	0	0	0	0	15	144
ICT30297 Certificate III in Telecommunications (CPE)	0	0	2	1	1	0
ICT30302 Certificate III in Telecommunications Cabling & Customer Premises Equipment	0	0	0	0	0	60
ICT30397 Certificate III in Telecommunications (CAN)	0	1	0	18	1	0
ICT30497 Certificate III in Telecommunications (Cabling)	45	171	287	411	314	200
ICT30699 Certificate III in Telecommunications (Customer Premises, Cabling & Equipment)	0	0	1	18	0	0
ICT40197 Certificate IV in Telecommunications	4	25	184	204	66	26
ICT40202 Certificate IV in Telecommunications Engineering	0	0	0	0	76	84
ICT40302 Certificate IV in Telecommunications Computer Systems	0	0	0	0	0	0
ICT40402 Certificate IV in Telecommunications Network Planning	0	0	0	0	0	0
ICT50197 Diploma of Telecommunications Engineering	0	39	101	103	109	62
ICT50202 Diploma of Telecommunications Engineering	0	0	0	0	30	74
ICT50302 Diploma of Telecommunications Computer Systems	0	0	0	0	0	0
ICT50402 Diploma of Telecommunications Photonics	0	0	0	0	0	0
ICT60197 Advanced Diploma of Telecommunications Engineering	4	2	1	99	185	29
ICT60202 Advanced Diploma of Telecommunications Engineering	0	0	0	0	60	102
ICT60302 Advanced Diploma of Telecommunications Computer Systems	0	0	0	0	0	0
Subtotal – Telecommunications	*280*	*789*	*1,791*	*2,401*	*2,749*	*1,888*
UTL98 Lifts Industry (electrical qualifications)						
UTL98 Lifts Industry (electrical qualifications only)						
UTL30198 Certificate III in Lift Systems (Electrical)	0	47	67	93	69	40
UTL40198 Certificate IV in Lift Systems (Electrical)	0	0	0	11	8	0
Subtotal – Lifts Industry	*0*	*47*	*67*	*104*	*77*	*40*
Total	**360**	**3,939**	**8,935**	**16,036**	**21,281**	**25,911**

Table A9: Vocational course enrolments (in-training) in selected training package qualifications 2004, by age, Australia

AQF level	Age 14 or less	15–24	25–34	35–44	45–54	55–64	65 and over	Unknown	Total
ICT									
Certificate II	0	386	260	179	97	25	0	3	**950**
Certificate III	0	132	184	138	84	20	0	3	**561**
Certificate IV	0	46	39	15	6	3	0	1	**110**
Diploma	0	96	26	7	6	1	0	0	**136**
Advanced diploma	0	87	17	17	7	2	0	1	**131**
Total	0	747	526	356	200	51	0	8	**1,888**
Total	**6**	**19,320**	**3,703**	**1,838**	**810**	**175**	**8**	**51**	**25,911**
UTE									
Certificate I	1	1,424	92	28	12	1	0	9	**1,567**
Certificate II	0	499	112	98	60	14	2	5	**790**
Certificate III	2	14,275	2,148	839	248	34	1	18	**17,565**
Certificate IV	0	137	205	143	110	19	2	0	**616**
Diploma	0	39	24	11	11	3	0	0	**88**
Advanced diploma	3	2,163	594	361	169	53	3	11	**3,357**
Total	**6**	**18,537**	**3,175**	**1,480**	**610**	**124**	**8**	**43**	**23,983**
UTL									
Certificate III	0	36	2	2	0	0	0	0	**40**
Certificate IV	0	0	0	0	0	0	0	0	**0**
Total	**0**	**36**	**2**	**2**	**0**	**0**	**0**	**0**	**40**

Table A10: Vocational course enrolments (excluding apprentices) in selected training package qualifications 2004, by age, Australia

AQF level	Age 14 or less	15–24	25–34	35–44	45–54	55–64	65 and over	Unknown	Total
ICT									
Certificate II	0	198	227	166	96	25	0	3	**715**
Certificate III	0	102	181	137	84	20	0	3	**527**
Certificate IV	0	40	37	15	6	3	0	1	**102**
Diploma	0	96	25	7	6	1	0	0	**135**
Advanced diploma	0	87	17	17	7	2	0	1	**131**
Total	**0**	**523**	**487**	**342**	**199**	**51**	**0**	**8**	**1,610**
UTE									
Certificate I	1	1,299	83	27	12	1	0	9	**1,432**
Certificate II	0	288	72	69	52	14	2	4	**501**
Certificate III	1	5,212	996	504	181	31	1	11	**6,937**
Certificate IV	0	133	204	143	110	19	2	0	**611**
Diploma	0	33	22	11	11	3	0	0	**80**
Advanced diploma	3	2,151	588	358	169	53	3	11	**3,336**
Total	**5**	**9,116**	**1,965**	**1,112**	**535**	**121**	**8**	**35**	**12,897**
UTL									
Certificate III	0	24	1	1	0	0	0	0	**26**
Certificate IV	0	0	0	0	0	0	0	0	**0**
Total	**0**	**24**	**1**	**1**	**0**	**0**	**0**	**0**	**26**
Total electrocomms									
Certificate I	1	1,299	83	27	12	1	0	9	
Certificate II	0	486	299	235	148	39	2	7	**1,216**
Certificate III	1	5,338	1,178	642	265	51	1	14	**7,490**
Certificate IV	0	173	241	158	116	22	2	1	**713**
Diploma	0	129	47	18	17	4	0	0	**215**
Advanced diploma	3	2,238	605	375	176	55	3	12	**3,467**
Total	**5**	**9,663**	**2,453**	**1,455**	**734**	**172**	**8**	**43**	**14,533**

Appendix C: Letter of invitation

National office | **national electrical and communications association**
Level 3, 100 Dorcas Street South Melbourne 3205 Australia
telephone +61 3 9645 5566 facsimile +61 3 9645 5577
email necanat@neca.asn.au

Monday 11 July 2005

Dear Industry Member

RE: Industry Skills Shortage Project

NECA has recently commissioned the National Centre for Vocational Education Research (NCVER) to undertake an analysis of the electrical and communications industry workforce across Australia.

As part of this project, NCVER is undertaking a series of consultations with contractor companies to assess skills shortages and the training needs of the industry. The types of issues that these consultations will explore include:

- The nature and extent of any skills shortages being experienced by contractors
- The current state of training for contractors' employees, including responsibility for training (TAFE, private training providers, schools, employers etc), financing of training and barriers to training
- Future training needs and directions, including strategies being put in place by contractors to ensure an adequate supply of skilled labour, planning to meet emerging technologies and development of career progression for new entrants and existing employees
- Identification of the key drivers of training (eg new technology, broadening of product knowledge, compliance and licensing requirements, safety considerations).

NECA has recommended your company to NCVER as a possible contributor to this important research. Any help you can provide to NCVER in this context would be appreciated

If you have any queries about this project, please contact Ms Kirsty Ring at NECA on telephone: 03 9645 5566 or email: kirsty@neca.asn.au.

Yours truly,

Peter Glynn
CEO NECA National

Appendix D: Interview guide

NECA–NCVER analysis of electrical and communications industry workforce

Topics – Contractor interviews

YOUR COMPANY AND ITS WORKFORCE

1. General background information about your company including:
    - Type of work done
    - Business and branch location(s)
    - Overall size of workforce (all employees, including those currently contracted to the company)
2. Workforce snapshots (a general picture) looking at …
    (a) Electrical employees, and
    (b) Communication employees
    - Approximate number of employees (including those contracted)
    - Occupations, type of employment (full-time, part-time, contract, permanent, etc.), age range, gender
    - Are there any changes occurring in your Electrical workforce? If so, what is happening? Are there any trends you can see?
3. Skills shortages
    - Is your company experiencing/anticipating any skills shortages?
    - In which fields (Electrical? and/or Communication?)
    - What occupations?
    - What types of skills (e.g. Technical skills, Project mgt, Small business mgt, Basic employability skills)
    - How serious is the problem?
    - What action needs to be taken?
    - Your recruitment policies directed at remedying skills shortages (e.g. appointing, retraining, progressing employees)

TRAINING

Looking at …

(a) Electrical employees, and
(b) Communication employees

- Occupations being trained.
- Types of employee being trained (full-time, part-time, contract, permanent, etc.), age range, gender.
- Level(s) of training (Informal/internal, entry level, semi-skilled, trade, advanced trade, technician, professional)
- Who does the training (e.g. your company, TAFE, private VET, university, VET in schools)
- What is driving the training (eg new technology, licensing/industry compliance requirements, OH&S, quality control)
- Main barriers to training
- Future training strategies in your company

A. First we would like to get an overall picture of your company and its operations, looking separately at Electrical and Communications if your company does both:

		Electrical	**Communications**
1	Industry sector(s)		
2	Location(s) of business/branches (if several locations/branches decide whether rest of information is to apply to all branches combined or a single branch).		
3	Approximate numbers of: (a) employees and (b) sub-contractors		
4	Occupations/job titles and number (or proportion) in each occupation.		
5	How are they mainly employed? (a) Permanent, Casual (b) Full-time, Part-time Are there any differences by occupation, age, gender?		
6	What are the typical ages of (a) Skilled employees – can use [<25yr] [25–44yr] [>44 yr] (b) Employees in training Are there any differences by occupation?		

7	What is the gender split (%) Are there any differences by occupation?		
8	Is employee turnover a problem? What are the usual reasons for employee turnover? Are there any discernible patterns: such as by age, gender, skills, occupations, qualification level (semi-skilled, trade, advanced trade, technician, professional)?		
9	Is your company experiencing or expecting to experience any skills shortages? If so: (a) In what occupations? (b) What types of skills? (eg technical skills, basic employability skills, project management, small business management) (c) What is/will be the impact of the shortages on your company (Crippling, Serious, Manageable, Minor)		
10	What strategies or changes are needed to address each shortage? State briefly any action your company is or will be taking to counter each shortage. Give approximate timelines if you can.		

B. Now, looking specifically at the training currently being done in your company and what you anticipate will be needed in the future:

		Electrical	**Communications**
11	What types of employees does the training target? Occupations Types of employee Entry level – persons new to the industry (e.g. apprentices, trainees) Employees needing to keep pace with technology and other developments in their existing jobs Employees up-skilling to higher level positions Employees whose positions have become redundant re-training for another job Full-time or Part-time Contract or Permanent		
12	What level is the training? Informal/internal AQF I (entry level) AQF II (semi-skilled) AQF III (trade) AQF IV (advanced trade) AQF V or VI (technician) AQF VII and higher (professional)		
13	How much time does the training typically take? Employee time? Number of employees Hours per month Overall time for an employee to complete the training Company time spent on training? Training development and management (hours/month) Training delivery (hours/month) What budget is allocated to training? And who contributes? (company, employee, government)		

14	Where and by whom is the training conducted? Informal/internal by a VET training institution TAFE? private? by employer off-job? on-job? By higher education (university) by schools (as VET in Schools)? Other (please specify) Are you happy with the training provided?		
15	Are there any commonly identifiable external drivers of the training? New technology Need to gain product knowledge Licensing or other industry compliance requirements Occupational health and safety Quality control How are you planning to deal with these demands/drivers?		
16	What do you see as the main barriers to training in your industry? What are the reasons companies are unwilling to undertake further training? What are the triggers needed to support further training?		
17	How do you go about recruiting and what do you look for in new employees and/or sub-contractors? What strategies do you use to retain, develop and support your employees (including career progression)?		

Supplementary questions for contractors

Impact of technological change

1 What changes in technology are impacting on your company (including new and different uses of the technology, installation techniques, and products)?

Skills

2 What new skills are needed to undertake the essential tasks in electrical and cabling work?

3 What existing skills are in need of updating?

4 What existing skills are becoming redundant?

Effect of skills shortages

5 As a contractor, are you restricted to employing electrical tradespersons when in fact you would like to employ people with other skills to meet your business needs (eg persons with home automation, smart wiring, and C-bus experience)? Or would your electrical tradesperson, to have other or additional skills?

If you are restricted in who you employ, is it because of:

(a) licensing requirements?

(b) a lack of people with the necessary skills and experience?

(c) any other reason?

Strategies for dealing with skill shortages

6 How are you currently bridging the gap between the skills you need in your business and the skills of your existing and incoming employees?

7 How does your company and its employees keep up to date with new technological developments?

Training

ACCREDITED TRAINING (courses delivered by TAFE or other training providers which lead to an award under the Australian Qualifications Framework – e.g. trade certificate, diploma).

8 To what extent is accredited training meeting the skill needs of your employees?

NON-ACCREDITED TRAINING (training recognised by industry but not leading to an award under the Australian Qualifications Framework – e.g. vendor training, some aspects of OH&S)

9 To what extent is non-accredited training being used to meet the skill needs of your employees?

10 Why is non-accredited training used in preference to accredited training (if the choice exists)?

VENDOR TRAINING

11 Is vendor training helping to fill any gaps? If so:

(a) in what areas?

(b) why is it used in preference to generic or accredited training?

12 Should any vendor training be incorporated into formal accredited training?

If so, identify which vendor training and tell us why it should be incorporated.

New technology as a driver of training

13 In which type of work is the introduction of new technology most strongly driving skills development (e.g. electrical installation, electrical servicing, data-communications, etc.)

14 In which client area is the introduction of new technology most strongly driving skills development (industrial, commercial, domestic, etc.)

Questions for training providers

Impact of technological change

1 What changes in technology appear to be presenting the greatest challenges, in terms of skills needs, to contractors in the electrotechnology segment of the industry?

Skills

2 What new skills are needed to undertake the core roles in electrotechnology?

3 What existing skills are in need of updating?

4 What existing skills are becoming redundant?

Training

ACCREDITED TRAINING (courses delivered by TAFE or other training providers which lead to an award under the Australian Qualifications Framework – e.g. trade certificate, diploma)

5 Do you think the accredited training your organisation provides is meeting the skills needs of contractors in the electrotechnology segment of the industry?

6 If it is not fully meeting contractors' skills needs, in which areas are there gaps and how serious are they?

NON-ACCREDITED TRAINING (training recognised by industry but not leading to an award under the Australian Qualifications Framework – e.g. vendor training, OH&S)

7 Do you think non-accredited training is filling any gaps in accredited training?

If so, in which areas?

8 Why do you think these gaps exist in accredited training?

9 Over the past three years has the amount of non-accredited training increased, remained unchanged, or decreased?

10 Can you identify any non-accredited training that should be accredited?

VENDOR TRAINING

11 What role do you think vendor provided training plays in the overall training picture for the electrotechnology industry?

In which areas is it mainly focused?

12 Why do you think it is being used instead of (generic) training provided by TAFE or other training providers?

13 Over the past three years do you think the amount of vendor training has increased, remained unchanged, or decreased?

14 Can you identify any vendor training that should be incorporated into formal accredited training?

15 Are there any ways in which vendors and TAFE could work more collaboratively in developing and delivering training? Are there any benefits to be gained from doing this?

New technology as a driver of training

16 In which type of work is the introduction of new technology most strongly driving skills development (e.g. electrical installation, electrical servicing, data-communications, etc.)

In which client area is the introduction of new technology most strongly driving skills development (industrial, commercial, domestic, etc)

Questions for vendors

1 In a few words, what vendor training does your company provide to industry? What are the main training topics or areas?

2 If possible we would like to obtain the following brief information for up to three typical vendor courses you offer:

	Course 1	**Course 2**	**Course 3**
Name of course			
Type of product or service the training covers			
Is the training accredited? (if so, please identify qualification it leads to)			
Trainer details: (*company position; industry qualifications; training qualification?*)			
Mode of course delivery (venue, training arrangement, length of course in hours)			
Number of commencements and completions per year			
Student age breakdown (<25 years; 25-44 years; >44 years)			
Typical occupations of students			
States & territories in which course conducted			

3 Is your company a Registered Training Organisation?

4 Do you think vendor training offers any special advantages in comparison with accredited training?

5 Could there be any advantage (or other justification) for incorporating some vendor training into accredited training (in effect, accrediting some vendor training)?

6 Are there any ways in which vendors and TAFE could work more collaboratively in developing and delivering training? Are there any benefits to be gained from doing this? What obstacles would need to be overcome?

7 If you could provide any of the following statistical information we would be very grateful.

(a) Overall, approximately how many students undertake your vendor training in a year?
  (1) Number of persons commencing courses per year
  (2) Number of course completions per year

(b) Can we break the number of commencements down demographically? For example:
  (1) Ages of trainees
  (2) Occupations of trainees (eg tradesperson, technician, trainer, contractor, etc)
  (3) Industry sectors in which they work (industrial, commercial, domestic)
  (4) Type of work they perform (electrical installation, cabling, data-communication, servicing/maintenance)
  (5) State/territory in which they work

The National Centre for Vocational Education Research (NCVER) is an independent body responsible for collecting, managing and analysing, evaluating and communicating research and statistics about vocational education and training (VET).

Through its commercial arm, NCVER provides professional research, development and implementation services to Australian and international clients.

The National Electrical and Communications Association (NECA) is the industry peak body representing the interests of contractors who are responsible for the delivery of electrical, voice and data communications systems in Australia.

National Centre for Vocational Education Research Ltd

Level 11, 33 King William Street
Adelaide SA 5000

PO Box 8288 Station Arcade
Adelaide SA 5000

Phone +61 8 8230 8400
Fax +61 8 8212 3436
Email ncver@ncver.edu.au

www.ncver.edu.au

National Electrical and Communications Association

Level 3, 100 Dorcas Street
South Melbourne Vic. 3205

Phone +61 3 9645 5566
Fax +61 3 9645 5577
Email necanat@neca.asn.au

www.neca.asn.au