Evidence of skill shortages in the electrotechnology trades



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NCVER

© 2000 National Centre for Vocational Education Research Ltd

ISBN 0 87397 636 3 print edition
0 87397 637 1 web edition

TD / TNC 63.09

Published by
National Centre for Vocational Education Research Ltd
ABN 87 007 967 311

252 Kensington Road, Leabrook, SA 5068
PO Box 115, Kensington Park, SA 5068, Australia
www.ncver.edu.au



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Preface

THREE WORKING GROUPS were established in late 1999 to examine trade skills shortages in the electrotechnology, engineering and automotive repairs and service trades. This followed discussions on emerging trade skills shortages between the Commonwealth Government and the leaders of Australia's major employer organisations—the Australian Chamber of Commerce and Industry (ACCI), the Australian Industry Group (AIG) and the Business Council of Australia (BCA).

The National Centre for Vocational Education Research (NCVER) was represented on each of the industry-led working groups. NCVER provided key statistical information and analysis of evidence of skill shortages in each of the trades under review. This analytical work proved important in each working group's deliberations about the specific nature of skill shortages in different trades and about proposals to address any emerging trade skills shortages.

This report on evidence of skills shortages in the electrotechnology trades is based on the analysis provided by NCVER to the Electrotechnology Working Group. This work also draws upon key information provided to the working group by the Department of Employment, Workplace Relations and Small Business (DEWRSB). This analysis contributed to the findings of the Electrotechnology Working Group's final report *Skill shortages in electrotechnology* presented to the National Industry Skills Forum held in Melbourne in April 2000. NCVER has also recently published a more detailed statistical report as part of this exercise. That report is *Australian apprentice and trainee statistics: Electrical and electronics trades 1995–1999*. This report revises and updates some of the figures presented in the above reports.

This report makes use of the terms 'apprenticeships' and 'traineeships', 'new apprenticeships' and 'contracts of training'. For all intents and purposes the terms are interchangeable. However, by way of clarification, it should be noted that apprentices and trainees enter into a contract of training for the term of their apprenticeship or traineeship. Australia has had apprenticeships since the early 1800s. Traineeships were introduced in 1985 to complement the apprenticeship system. Apprenticeships and traineeships were merged into a single national system—new apprenticeships—on 1 January 1998.

1 Introduction

Recently employers in a number of critical economic sectors have been reporting increased difficulties in securing the skills required by their industries. Certainly there has been growing concern about skill shortages in a number of sectors in the Australian labour market in the past couple of years with the increased demand for some skills as a result of improvements in the Australian economy. However, such concerns are not particularly new since skill shortages are a recurring and persistent feature of the Australian labour market. In the electronics industry, for example, the National Electronic Contractors' Association (NECA) has reported evidence of skill shortages in some sectors of the industry for periods prior to the recent resurgence of concern about skill shortages in Australia (see NECA 1998).

In developing appropriate industry- or sector-based responses to skill shortages, it is necessary to first determine:

- the extent of skill shortages in terms of the types of skills in short supply and the areas where they are in short supply
- the underlying causes of the existing shortages

With respect to underlying causes, skill shortages in the trades can arise from:

- an inadequate number of people entering trade training
- a high attrition rate during the training period, which means not enough people are completing trade training and attaining the qualifications necessary for highly skilled / technical work in the trades
- a high separation from the skilled trades workforce once people are qualified due to a variety of reasons, such as low demand for skills, declining industry employment prospects or better careers and conditions being offered in other industries / sectors
- an insufficient level of activity by the existing trade workforce in upgrading skills once initial qualifications have been attained
- a failure in the provision of training to ensure that the quality and relevance of training provision is keeping up with rapidly changing skills needs in the workforce
- a combination of the above

In this report, available evidence about patterns and trends in trades employment and training in the electrotechnology industry is reviewed in order

to gauge the nature and extent of any skills shortages in these electrotechnology trades. This report has been prepared using statistical information supplied by NCVER, the Australian Bureau of Statistics (ABS) and key information provided by the Department of Employment, Workplace Relations and Small Business. This report also makes use of information collected by the National Electronic Contractors' Association from employers about their recent experiences of skill shortages.

The electrotechnology trades examined in this report cover a range of electrical and electronic trades including:

- electricians
- electrical engineering associate professionals
- refrigeration and air-conditioning mechanics
- electrical distribution tradespersons
- electronic instrument tradespersons
- electronic office and equipment tradespersons
- communications tradespersons

There is also a growing number of electrical and telecommunications trades assistants.

2 Demand for skills in the electrotechnology trades

2.1 Employment levels

TOTAL EMPLOYMENT IN the electrotechnology trades workforce is almost 200 000 people. This amounts to some 2.3 per cent of all employment in Australia. Electrotechnology trades are the third largest area of employment in Australia's trades workforce (behind the building and construction and the metal trades), accounting for some 16 per cent of total trades employment in Australia.

As shown in table 1, the largest single electrotechnology trades occupation is electricians, accounting for more than half of the total electrotechnology trades workforce. The other significant electrotechnology trades occupations are electronics communications tradespersons and electronic office and equipment tradespersons, accounting for 15.4 per cent and 18.6 per cent of skilled electronic trades employment respectively.

Table 1: Employment in electrotechnology trades occupations

Trades occupation		Employment in August 1999	
		Number ('000)	Share (%)
3123	Electrical engineering associate professionals	8.6	na
4411	Electricians	96.6	52.7
4312	Refrigeration and air-conditioning mechanics	17.2	9.4
4313	Electrical distribution tradespersons	6.5	3.6
4314	Electronic instrument tradespersons	0.6	0.3
4315	Electronic & office equipment tradespersons	34.1	18.6
4316	Communications tradespersons	28.2	15.4
Total		**191.9**	**100.0**

Note: na – not available

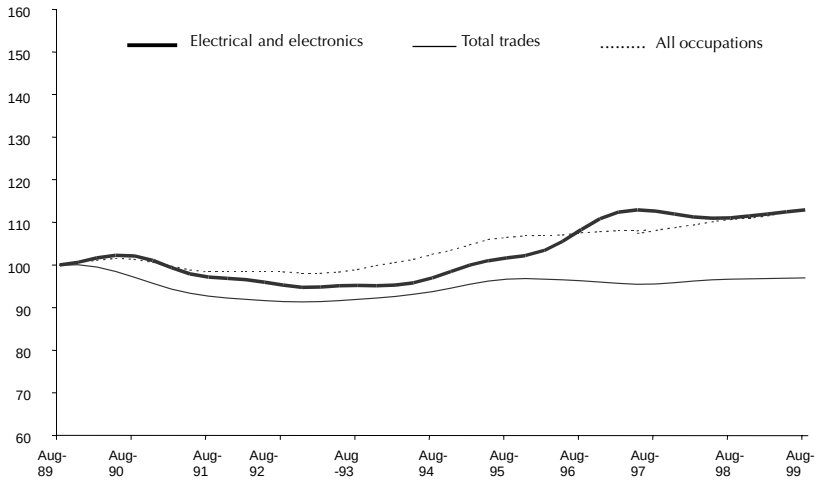
Source: Figures supplied to NCVER from ECONTECH

In addition to the skilled trades occupations depicted in table 1, there are a further 2200 electrical and telecommunications trades assistants.

2.2 Employment growth

There has been relatively strong employment growth over the past decade. Electrotechnology trades employment grew by an average of 1.3 per cent per year over the past decade. As shown on figure 1, this growth has been stronger than for employment growth in the trades generally.

Figure 1: Electrotechnology, total trades and total employment, 1989–99 (indexed)



Source: ABS 1999. These detailed occupational forecasts have not previously been published. Those interested in industry-level forecasts can refer to Murphy (1999).

2.3 Employment prospects

An underlying precondition for the existence of skill shortages is usually (but not always) a rising demand for skilled labour in a growing labour market. Of course it is possible for skill shortages to exist in a declining labour market, but this situation is much less frequent.

Employment forecasts (made by using the Econtech model), predict modest employment growth in the electrotechnology trades of around 2.5 per cent per year in the coming years. This is shown in table 2.

However, the projected growth is different across the different skilled trades within the electrotechnology trades. For instance, the communications tradespersons occupation category has the highest forecast average annual growth rate of 5.4 per cent. Only one category, electrical distribution tradespersons, has a forecast decline—from 7400 in 1997–98 to 7200 in 2000–01.

In relation to the electrical and telecommunications trades assistants occupation category, specifically, the total number in employment is forecast to grow from 3500 in 1997–98 to 3700 in 2000–01, representing an average annual growth rate of 2.0 per cent.

Table 2: Electrotechnology trade occupations employment forecasts

Trades occupation	Average annual growth	Total employment		Share of total employment	
	1997–98 to 2000–01	1997 –98	2000 –01	1997 –98	2000 –01
	(%)	('000)	('000)	(%)	(%)
3123 Electrical engineering associate professionals	0.9	8.2	8.4	0.1	0.1
4311 Electricians	2.4	99.2	106.3	1.2	1.2
4312 Refrigeration & air-conditioning mechanics	2.2	13.0	13.9	0.2	0.2
4313 Electrical distribution tradespersons	-0.6	7.4	7.2	0.1	0.1
4314 Electronic instrument tradespersons	0.8	0.6	0.6	0.0	0.0
4315 Electronic & office equipment tradespersons	0.9	27.0	27.7	0.3	0.3
4316 Communications tradespersons	5.4	31.2	36.5	0.4	0.4
Sub-total all electrotechnology trades	*2.5*	*186.6*	*200.6*	*2.3*	*2.3*
9918 Electrical & telecommunications trades assistants	2.0	3.5	3.7	0.0	0.0

Source: Econtech model projections supplied to NCVER

These projections indicate faster employment growth in the electrotechnology trades in the next two years, than was experienced on average over the past decade.

However, longer-term forecasts by DEWRSB (using the Monash model) suggest that electrotechnology employment to the year 2004–05 is, on average, projected to grow at a slower rate than employment generally. In part, this projection reflects the completion of construction of the Sydney Olympic site and the absence of any infrastructure project of comparable size and complexity.

2.4 Overview of the demand for electrotechnology skills

The patterns of employment growth in the electrotechnology trades suggest an increase in already expanding employment in these trades, noting the very strong growth in vacancies that have been experienced recently.

DEWRSB reports that the demand for the electrotechnology trades is closely linked to trends in building and construction (residential, commercial and other constructions, including resource development), manufacturing, electrical generation and distribution, the wholesale and retail industries and transport. The strong activity in the construction and transport sectors is generating demand for electrical tradespersons. Wholesale and retail activity has been healthy and this has had a positive flow-on effect on demand. Some factors have also led to an easing of the demand for electrotechnology tradespersons in recent years, such as the negative impact of the Asian economic difficulties on some resource projects, especially in Western Australia and the Northern Territory.

The overall situation concerning the demand for trades skills in the electrotechnology sector is summarised in box 1.

Box 1: Demand for skills in the electrotechnology trades

- Electrotechnology trades are an important and growing industry sector, with over 200 000 people in the skilled trades workforce.
- Employment growth in the electrotechnology skilled trades workforce over the past decade has been much higher than growth in the workforces of all skilled trades in Australia.
- Total employment in the electrotechnology skilled trades is projected to grow at an even faster rate over the next few years (that is, by 2.5 per cent per year).
- These patterns are consistent with the necessary preconditions for increased skills shortages in the electrotechnology trades.

3 Supply of skills to the electrotechnology trades

THE SUPPLY OF skills to the electrotechnology trades comes from four major sources. These are:

- the skills of the existing trades workforce, including the upgrading of skills of the existing workforce
- new apprentices entering the electrotechnology trades
- skills training undertaken through other (non-apprentice) training pathways
- skilled migration into the electrotechnology trades

The other critical issue relating to the supply of skills to the electrotechnology trades concerns the rate of skills wastage arising from skilled and qualified labour leaving these skilled trades occupations. Each of these factors is examined below in this section of the report.

3.1 Skills of the existing electrotechnology trades workforce

Some 70 per cent of the skilled trades workforce in the electrotechnology trades have post-school qualifications, as shown in table 3.

This is a much higher proportion than the average for the whole Australian workforce, this proportion being below 50 per cent.

The information in table 3 shows the highest qualification attained. Some of those with degrees, diplomas and associate diplomas may also have vocational qualifications.

For the electrotechnology trades as a whole:

- Almost 9 per cent of employed persons have a diploma or advanced diploma (or equivalent) as their highest qualification, which is a slightly higher rate than the 8 per cent for the workforce as a whole.
- Almost 60 per cent possess a vocational qualification, compared to a workforce average of less than 20 per cent of employed persons having a vocational qualification as their highest level attained.
- Only 2.6 per cent possess a degree level or higher qualification compared to over 15 per cent having such qualifications in the workforce as a whole.

Table 3: Educational attainment of persons employed in the electrotechnology trades, and the total workforce, 1996

Occupational category		Proportion of workforce with (%)								
		Degree or higher	Diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	Sub-total with qualifications	No qualification	Not stated/ unknown	**Total**
3123	Electrical engineering associate professionals	3.1	2.4	22.5	52.0	4.0	84.0	12.3	3.7	**100.0**
3124	Electronic engineering technicians	4.8	3.2	20.6	41.8	6.7	77.1	17.3	5.6	**100.0**
4311	Electricians	0.8	0.6	3.2	74.1	1.0	79.7	16.4	3.9	**100.0**
4312	Refrigeration & air-conditioning mechanics	1.0	0.8	1.7	67.3	1.0	71.8	23.8	4.4	**100.0**
4313	Electrical distribution tradespersons	0.3	0.2	0.9	58.2	4.7	64.3	25.7	10.0	**100.0**
4314	Electronic instrument tradespersons	2.9	2.2	11.9	66.4	3.2	86.6	11.9	1.5	**100.0**
4315	Electrical & office equipment tradespersons	9.0	3.2	9.4	30.5	4.7	56.8	35.5	7.7	**100.0**
4316	Communications tradespersons	1.9	1.2	4.6	34.5	3.1	45.3	47.5	7.2	**100.0**
4310	Other electrotechnology trades	0.3	1.0	2.1	43.0	1.8	48.2	45.1	6.7	**100.0**
Sub-total all electrotechnology trades		*2.6*	*1.5*	*7.3*	*56.4*	*2.8*	*70.6*	*24.1*	*5.3*	***100.0***
9918	Electrical & telecommunication trades assistants	1.1	0.7	0.9	18.3	2.4	23.4	70.4	6.2	**100.0**
Total electrotechnology		**2.6**	**1.4**	**7.2**	**55.9**	**2.9**	**70.0**	**24.7**	**5.3**	**100.0**
Total Australia workforce		**15.5**	**4.5**	**3.5**	**14.2**	**3.8**	**41.5**	**51.3**	**7.2**	**100.0**

Sources: NCVER 1998; ABS, unpublished data from the 1996 Census of Population and Housing

In relative terms, this means that the proportion of the workforce in electrotechnology trades who possess relevant qualifications (that is, diploma and other vocational qualifications) is very high compared to the levels of qualifications attained in the workforce as a whole.

Significantly, the numbers who have no formal post-school qualifications, but are working in the electrotechnology trades, are less than 25 per cent of the total workforce. This is a comparatively low level, given that around half of the Australian workforce reported having no post-school qualification in 1996.

A summary of the situation concerning the existing skills of the existing workforce is given in box 2 below.

Box 2: Skills of the existing electrotechnology trades workforce

- Some 70 per cent of the existing electrotechnology trades workforce hold a post-school qualification, compared with only 50 per cent of the workforce as a whole having qualifications.
- The incidence of vocational qualifications in the electrotechnology trades workforce is very high (60 per cent), compared with fewer than 20 per cent of the national workforce having a vocational qualification.
- But one-quarter of the electrotechnology trades workforce has no formal qualifications. This situation may not meet contemporary industry needs for high-level technical skills.

3.2 New apprenticeship patterns and trends

Australia's national and State and Territory governments have reformed the apprenticeship and trainee system by making it more flexible and responsive to employer needs with the aim of ensuring that higher-quality and more relevant training is provided. The new training arrangements covering apprenticeships and traineeships are collectively known as new apprenticeships. They were introduced from 1 January 1998.

Although new apprenticeships cover both apprentice and traineeship training, the vast majority of entry-level skills training in the electrotechnology trades through contracts of training with employers occurs through the apprenticeship pathway, and leads to a certificate III qualification (typically involving a four-year apprenticeship contract).

The apprenticeship pathway accounts for almost all those in contracts of training as electricians, refrigeration and air-conditioning mechanics, electrical distribution tradespersons and electronic instrument tradespersons. Moreover, almost all of those in the other electrotechnology tradespersons category are also apprentices.

At the end of 1999, of the nearly 18 500 people in electrotechnology contracts of training (that is, new apprentices) (shown in table 4), apprenticed trades (at the certificate III level) accounted for over 90 per cent of the total.

Table 4: Electrotechnology new apprenticeships, 31 December 1999

Occupational category		No. of new apprentices ('000)	Proportion of total new apprentices (%)	New apprentices as a proportion of total skilled trades workforce (%)
3123	Electrical engineering associate professionals	0.10	0.5	1.2
3124	Electronic engineering technicians	–	–	–
4311	Electricians	11.62	63.0	10.9
4312	Refrigeration & air-conditioning mechanics	1.78	9.6	12.8
4313	Electrical distribution tradespersons	0.34	1.8	4.7
4314	Electronic instrument tradespersons	0.32	1.7	53.3
4315	Electronic & office equipment tradespersons	0.32	1.7	1.2
4316	Communications tradespersons	0.44	2.4	1.2
9918	Electrical & telecommunications trades assistants	0.58	3.1	15.6
	Other electrical & electronic new apprentices	2.96	16.0	–
Total		**18.46**	**100.0**	**9.2**

Source: NCVER unpublished apprentice and trainee data

The contracts of training where non-traditional apprenticeships (that is, traineeships) are more prevalent are in the occupations of electrical engineering associate professionals, electrical engineering technicians, electronic and office equipment tradespersons, communication tradespersons and electrical and telecommunications trades assistants.

Electrical engineering associate professionals' and electronic engineering technicians' contracts of training are all at the certificate IV / advanced diploma or diploma levels. Electronic and office equipment tradespersons and communications tradespersons have a mix of certificate II and certificate III and higher pathways, whereas electrical and telecommunications trades assistants are almost all in certificate II traineeships.

As can be seen from table 4, the number of new apprenticeships as a proportion of the skilled trades workforce varies considerably between the different occupations in the electrotechnology trades. In the major traditional occupations—electricians and refrigeration and air-conditioning mechanics—apprentices make up almost 11 per cent and 13 per cent of the total skilled trades workforce, respectively.

In the newer high-technology areas where traineeship pathways are more important, skills training through contracts of training is a much more recent

phenomenon. The numbers in training as a proportion of the skilled workforce are only just over one per cent in the skilled occupations of communications tradespersons and electronic and office equipment tradespersons. These are very low rates. These sectors, which employ some one-third of the total skilled trades workforce in the electrotechnology occupations, require specific attention, if the penetration of skilled trades training is to be raised in the electrotechnology sector as a whole in Australia.

Overall, the proportion of the total skilled trades workforce in the electrotechnology trades is just under 10 per cent (that is, 9.2 per cent as shown in table 4). This average is lower than for all skilled trades in Australia, whereas almost 12 per cent of the skilled trades workforce, on average, is supplied by those in new apprenticeships.

The key issues to consider in relation to the contribution of apprentices and trainees to the supply of skills, are whether or not:

- the numbers entering contracts of training are sufficient to meet industry needs
- the numbers staying in apprenticeships and traineeships to complete their training are adequate

Apprenticeship training in the electrotechnology trades (and all other major trades) experienced a decline in Australia in the early 1990s from the record high levels of the late 1980s.

Since the mid-1990s, we have seen a significant turnaround in the level of electrotechnology apprentice and trainee activity.

The annual growth rate of new apprentice commencements in the electrotechnology trades was 4.7 per cent per year between 1995 and 1999. As shown in table 5, the growth rate was even stronger between 1998 and 1999, being almost 10 per cent. New apprentice commencements in these trades exceeded 6100 Australia-wide during 1999.

Overall, this growth rate in commencements since the mid-1990s compares favourably with the net growth in employment in the electrotechnology trades which has averaged 1.3 per cent in the last decade, and is forecast to grow by 2.5 per cent per year in the coming years.

These NCVER data suggest that problems relating to insufficient numbers entering skilled trades training relate to particular occupations within the electrotechnology trades, rather than being an across-the-board problem. Electronic and office equipment tradespersons is a sector that may warrant particular consideration in this regard (table 5).

There has also been a significant improvement in the overall numbers in apprenticeships or traineeships in the electrotechnology trades since the mid-1990s. The annual growth rate in the numbers in training was 3.5 per cent each year since between 1995 and 1999 as shown in table 6.

Table 5: Commencements in contracts of training in the electrotechnology trades, 1995–99

Occupational category		Number					Annual growth rate 1995–99[a]	Annual growth rate 1998–99
		1995	1996	1997	1998	1999	(%)	(%)
3123	Electrical engineering associate professionals	10	*	30	30	50	42.9	92.3
3124	Electronic engineering technicians	*	*	*	*	*	-	-
4311	Electricians	3410	3055	3350	3650	4070	4.5	11.3
4312	Refrigeration & air-conditioning mechanics	500	450	570	600	640	6.4	5.6
4313	Electrical distribution tradespersons	160	140	120	110	100	-11.5	-13.4
4314	Electronic instrument tradespersons	40	50	80	100	130	37.9	31.3
4315	Electronic & office equipment tradespersons	270	235	150	150	140	-15.4	-3.4
4316	Communications tradespersons	50	80	130	160	300	54.7	86.3
	Other electrical & electronics tradespersons[b]	650	1070	830	770	690	1.7	-10.1
Sub-total all electrotechnology trades		*5090*	*5080*	*5260*	*5570*	*6110*	*4.7*	*9.8*
9918	Electrical & telecommunications trades assistants	80	330	410	570	720	71.6	25.4

Note: *less than 10
[a] compounded growth rate
[b] not known at 4-digit level
Figures may not total due to rounding

Source: NCVER unpublished apprentice and trainee data

Table 6: Number of apprentices and trainees in contracts of training in the electrotechnology trades number in-training, 1995–99

Occupational category		Number					Annual growth rate 1995–99[a]	Annual growth rate 1998–99
		1995	1996	1997	1998	1999	(%)	(%)
3123	Electrical engineering associate professionals	20	20	40	60	100	44.4	61.3
3124	Electronic engineering technicians	*	*	*	*	*	-	-
4311	Electricians	10990	11100	10970	11120	11620	1.4	4.5
4312	Refrigeration & air-conditioning mechanics	1390	1450	1580	1710	1780	6.4	4.0
4313	Electrical distribution tradespersons	590	550	440	400	340	-13.0	-14.1
4314	Electronic instrument tradespersons	110	150	300	310	320	30.0	3.9
4315	Electronic & office equipment tradespersons	950	810	610	430	320	-23.7	-25.8
4316	Communications tradespersons	130	160	260	320	440	35.5	38.7
	Other electrical & electronics tradespersons[b]	1400	2020	2400	2790	2960	20.6	6.1
Sub-total all electrotechnology trades		*15590*	*16270*	*16600*	*17140*	*17890*	*3.5*	*4.3*
9918	Electrical & telecommunications trades assistants	80	310	350	520	580	66.1	10.5

Note: * less than 10
[a] compounded growth rate
[b] not known at 4-digit level
Figures may not total due to rounding

Source: NCVER unpublished apprentice and trainee data

The growth rate in the number of new apprentices was even stronger between 1998 and 1999, being 4.3 per cent. The total number of electrotechnology new apprentices reached almost 18 500 by the end of 1999 (i.e. the total of all electrotechnology trades plus trades assistants). Again this growth has varied in different sectors within the electrotechnology trades.

The annual growth rate of 3.5 per cent per year in the numbers in training over the 1995 to 1999 period compares favourably to the overall projected net growth in employment of 2.5 per cent per year. However, growth in the numbers in training at these levels will only make small in-roads into raising the ratio of new apprentices to the total skilled trades workforce in Australia's electrotechnology sector.

The completions of electrotechnology new apprenticeships to date have not been as promising. Numbers of completions actually fell marginally between 1995 and 1999 (table 7). Fortunately this trend has turned around during 1999 where a 1.8 per cent increase was reported, bringing the number of electrotechnology new apprentice completions to over 3600 during 1999.

Looking at crude completion rates (that is, the ratio of completions to commencements four years earlier), this amounts to a completion rate of just over 70 per cent of all commencements in 1995 (noting that the contracts of training in these trades average around four years' duration). This is a reasonably healthy rate of completion.

It is important to point out that NCVER has found that there are problems with completions data. The reported new apprentice completions are below the true level of completions being recorded in national data, because not all completions are being reported. This means that care should be taken in interpreting completions data.

Nevertheless, the reported number of completions of over 3600 per year is not sufficient to supply all of the projected growth in employment of 2.5 per cent per year—a growth of around 5000 trades jobs each year.

A significant issue with respect to the supply of skills to the trades through new apprenticeships concerns the age of apprentices and trainees.

The numbers of 15–19-year-olds in electrotechnology apprenticeships has been growing, even though there has been a very marginal decline in the proportion of commencing apprentices (and trainees) aged 15–19 years over the period 1995 to 1999. In fact, the number of commencing apprentices (and trainees) has grown across all age groups since 1995. The number of 15–19-year-olds commencing in a contract of training in the electrotechnology trades grew by over 4 per cent per year between 1995 and 1999, with very strong growth of over 10 per cent in the past year. The annual growth rate in commencements by those aged 20–24 years was 4.6 per cent per year over the period 1995 to 1999.

Table 7: Completions from contracts of training in the electrotechnology trades, 1995–99

Occupational category		Number					Annual growth rate 1995–99[a]	Annual growth rate 1998–99
		1995	1996	1997	1998	1999	(%)	(%)
3123	Electrical engineering associate professionals	*	*	10	*	10	18.9	150.0
3124	Electronic engineering technician	*	*	*	*	*	-	-
4311	Electricians	2690	2330	2550	2540	2380	-3.0	-6.5
4312	Refrigeration & air-conditioning mechanics	250	260	320	290	370	10.3	29.2
4313	Electrical distribution tradespersons	170	150	140	120	110	-10.7	-10.3
4314	Electronic instrument tradespersons	40	30	50	80	90	19.6	6.2
4315	Electronic & office equipment tradespersons	320	240	210	200	150	-17.4	-24.6
4316	Communications tradespersons	20	20	20	40	90	41.4	148.6
	Other electrical & electronics tradespersons[b]	170	230	280	290	430	26.3	48.6
Sub-total all electrotechnology trades		*3660*	*3270*	*3570*	*3550*	*3610*	*-0.3*	*1.8*
9918	Electrical & telecommunications trades assistants	10	50	220	210	320	122.4	50.7

Note: * less than 10

[a] compounded growth rate

[b] not known at 4-digit level

Figures may not total due to rounding

Source: NCVER unpublished apprentice and trainee data

Table 8: Age of new apprentices in the electrotechnology trades[a]

Age of apprentices and trainees	Proportion of total apprentices and trainees			Annual growth rate	Growth rate
	1995 (%)	1998 (%)	1999 (%)	1995–99[b] (%)	1998–99 (%)
No. of commencements					
15–19-year-olds	68.2	66.2	66.6	4.1	10.4
20–24-year-olds	21.6	22.5	21.5	4.6	4.9
25 years or more	10.2	11.3	11.9	8.7	15.6
All ages	100.0	100.0	100.0	4.7	9.8
Total no. in training					
15–19-year-olds	28.2	29.0	30.0	5.1	3.4
20–24-year-olds	59.3	57.7	56.4	2.2	-2.2
25 years or more	12.5	13.4	13.7	5.8	2.2
All ages	100.0	100.0	100.0	3.5	0.0

Note *less than 10
[a]excludes electrical and telecommunications trades assistants
[b]compounded growth rate
Source: NCVER unpublished apprentice and trainee data

As is shown in table 8, in fact there has been little change in the proportions of different age groups among all those in training since the mid-1990s.

- The proportion of teenagers in electrotechnology contracts of training has risen very slightly from 28.2 per cent to 30.0 per cent over the 1995 to 1999 period.
- The proportion of 20–24-year-olds in training fell marginally from 59.3 per cent in 1995 to 56.4 per cent in 1999, and the proportion aged 25 years or more rose slightly from 12.5 per cent to 13.7 per cent during this period.

The number of teenagers entering and undertaking new apprenticeships in the electrotechnology trades is growing, despite the rapid ageing of the Australian population.

This is a critical point. NCVER reports that demographic projections show that the number of persons in Australia aged 15–24 years will not grow in absolute terms over the next 20 years. In fact, the relative proportion of young people in the population will fall considerably. This means the source of new skills for the electrotechnology trades, as for all other occupations, will increasingly have to come from apprentices and trainees, who are older when commencing a contract of training.

The other issue of relevance here is the very low level of new apprenticeships in schools in relation to the electrotechnology trades. NCVER (2000) reports that for the electrotechnology trade occupations, the number of apprentices and trainees who commenced their apprenticeship or traineeship while still attending school comprised an insignificant proportion for each year 1995 to 1998.

Clearly this is an area for consideration in any strategy to boost the intake of younger people to new apprenticeships in the electrotechnology trades.

A summary of the situation concerning the contribution of apprentices and trainees to the electrotechnology trades is given in box 3 below.

Box 3: Supply of electrotechnology apprentices and trainees

- The number of apprentices and trainees (now called new apprenticeships) in a contract of training with an employer in the electrotechnology trades reached nearly 18 500 in 1999. The annual growth rate in electrotechnology apprentices and trainees was 3.5 per cent per year between 1995 and 1999. The growth rate was 4.5 per cent during 1999.
- The annual growth rate in commencements in electrotechnology new apprenticeships are now growing at a strong rate of nearly 10 per cent per year, which is a level sufficient to meet projected employment growth of 2.5 per cent per year in the skilled electrotechnology trades. This means insufficient entry to trades apprenticeships is now not the predominant cause of any skill shortages in the electrotechnology trades.
- Apprentice and trainee completions in the electrotechnology trades actually declined marginally between 1995 and 1999, although there has been an encouraging boost to completions of 1.8 per cent during 1999. Nevertheless, this means measures to encourage completion of new apprenticeships must be a critical element of any strategy to boost skills in the electrotechnology trades.
- In absolute terms, new apprentice completions of over 3600 per year are not sufficient to supply all of the projected employment growth of 2.5 per cent per year in these trades, that is, some 5000 new trades jobs each year.
- Sustained higher rates of growth in new apprentice completions will be necessary if we are to make in-roads into increasing the numbers in these trades with appropriate qualifications. There is a strong case for growth of the proportions of those with appropriate qualifications rising in this sector, given the increasing complexity of the technology used in the electrotechnology trades. Also it is important to note that the ratio of new apprentices to the total skilled electrotechnology trades workforce is a relatively low 9.2 per cent (compared with other trades).
- However, some of the additional training provision required will come from sources other than new apprenticeships.
- The case for growth is particularly strong in some of the non-traditional areas, such as in the higher level (certificate IV or higher) technician occupations in electronics and telecommunications.

3.3 Training undertaken through non-apprentice pathways

This section looks at students undertaking vocational education and training (VET) courses in 1998 that were not new apprenticeships but were aimed at skills for jobs in the electrotechnology occupations. As such it excludes those in streams in which apprentices and trainees would be expected to be most likely enrolled (that is, streams 3211, 3212, 3221).

It should be noted that for the apprentice and trainee data presented elsewhere in this report, the Australian Standard Classification of Occupations (ASCO) code is based on apprentices' and trainees' declared vocation, that is, the actual job that they are employed in while undertaking a new apprenticeship. The data presented in this section are based on occupation codes assigned to courses to indicate the most likely occupation to which the course is relevant. However, students undertaking a VET course may not necessarily gain employment in the electrical or electronics occupation assigned to the course.

The data in this section therefore provide a rough estimate of the amount of non-apprentice and non-trainee VET activity relevant to the electrotechnology trade occupations—regardless of whether or not this training is actually utilised in these occupations.

Indications are that around 24 000 students were enrolled in a non-apprentice or non-trainee VET course in 1998 relating to the electrical trade occupations. Almost 47 per cent of these were at Australian Qualifications Framework (AQF) level III or equivalent or higher levels. There were also some 3400 students enrolled in a non-apprentice or non-traineeship VET course in 1998 relating to electrical and telecommunications trades assistants occupations.

A critical point is that over one-third of these students were enrolled in high level programs at the diploma, advanced diploma or certificate IV level as shown in table 9.

This means that non-apprenticeship training pathways have now become a very substantial source of skills for the electrotechnology trades.

The NCVER figures show that by the end of 1998 (that is, on 31 December 1998) there were just under 18 000 students in new apprenticeships in the electrotechnology trades, compared with some 24 000 enrolments during 1998 in VET courses not involving a new apprenticeship but oriented towards skills for the electrotechnology occupations.

A wide variety of different types of training is occurring in these non-apprentice training programs; for instance, of these non-apprentice students:

- 35.7 per cent were in advanced / high level courses leading to diplomas, advanced diplomas or certificate IV level qualifications
- 11.2 per cent were in certificate III programs, which are traditionally undertaken through apprenticeships

Table 9: Training in the electrotechnology trades—non-apprentice and non-trainee VET students, 1998

Occupational category		Diplomas	AQF certificate IV & equivalent	AQF certificate III & equivalent	AQF certificates I & II	Other certificates, endorsements and other	Statements of attainment	Non-award courses	Total students[1]
3123	Electrical engineering associate	3 190	2 190	330	20	0	70	10	**5 660**
3124–13	Electronic engineering technician	210	800	0	280	0	30	0	**1 320**
43	Electrical & electronics tradespersons	130	2 400	2 460	1 550	1 340	3 740	2 860	**14 000**
Net sub-total		*3 520*	*5 370*	*2 790*	*1 850*	*1 340*	*3 840*	*2 870*	***20 640***
Electrical & telecommunications trade assistants		0	0	(a)	1 740	420	40	1 210	**3 400**
Total electrotechnology		**3 520**	**5 370**	**2 800**	**3 590**	**1 750**	**3 880**	**4 080**	**24 040**
% of total electrotechnology		14.1	21.6	11.2	14.3	7.0	15.5	16.3	**100.0**

Note: (a) – Represents figures between 1 and 9 inclusive

[1]As some students enrol in more than one course, the total number of enrolments exceeds the total number of students

Source: NCVER unpublished Australian vocational education and training statistics

- 14.3 per cent were in certificate I and II level programs
- 38.8 per cent were undertaking skills training not leading to award or full qualifications

Clearly this non-apprentice training activity represents a wide range of training pathways, from advanced technical courses leading to high-level qualifications through to persons already employed in the industry upgrading their skills through enrolment in one or more modules.

The importance of non-apprenticeship pathways as a source of skills for electrotechnology occupations is summarised in box 4 below.

Box 4: Non-apprentice pathways for skills in electrotechnology trades

- Alternative vocational pathways are becoming just as important sources of skills for electrotechnology occupations in Australia as the traditional apprenticeship pathway.
- Throughout 1998 there were some 24 000 enrolments in vocational education and training programs that were not new apprenticeships compared to the less than 18 000 new apprentices in training by the end of 1998.
- The largest category of these non-apprenticeship enrolments (47 per cent) were in courses at the certificate III level or higher. Only 14 per cent were at certificate levels I and II.
- Non-apprenticeship pathways need to be given as much priority as new apprenticeship pathways in any overall skill formation policies for the electrotechnology trades, particularly given that new sources of relevant skills will need to come increasingly from older persons in the future.

3.4 Migration as a source of electrotechnology skills

Migration of skilled labour is a source of skills that supplements the domestic skill base in the electrotechnology trades.

DEWRSB reports that, in recent years, net migration of electrotechnology tradespersons has fluctuated around 400 to 600, with arrivals of around 1300 to 1400 partly offset by departures of about 750 to 850. This is shown in table 10.

Thus, migration is a relatively insignificant source of skills for the electrotechnology trades in Australia.

This situation is not likely to change. Even if governments were to open up immigration intakes, it is highly unlikely that this would increase net intakes in a significant way because of the global demand for skills in the electrotechnology fields.

Table 10: Migration of electrotechnology tradespersons

Year	Permanent and long-term arrivals departures	Permanent and long-term	Net permanent and long-term			
			Settler	Long-term residents	Long-term	Permanent visitor & long-term total
1996–97	1289	743	509	52	-15	546
1997–98	1295	868	432	38	-43	427
1998–99	1403	810	622	-102	73	593

Source: Data supplied by the Department of Employment, Workplace Relations and Small Business

The potential for increased migration as a source of new skills in the electrotechnology trades in Australia is summarised in box 5 below.

Box 5: Migration as a source of new electrotechnology skills

- Net migration is a relatively insignificant source of skills for the electrotechnology trades in Australia with between 400 and 600 per year (compared to a skilled trades workforce in this area of almost 200 000).
- Rapidly burgeoning global demand for electrotechnology skills, particularly for advanced and high-level technical skills, means that migration is likely to remain an insignificant source of such skills for Australia in the future.

3.5 Skills wastage from electrotechnology occupations

The issue of the extent to which qualified and skilled tradespersons leave their employment in their skilled trade is a critical one. This is because the formation of new skills in the trade must be sufficient:

- not only to meet skills needed to fuel growth in the industries
- but also to replace those skills leaving through occupational wastage

DEWRSB reports that the proportion of electrotechnology tradespersons who leave these occupations appears to be below the average for all occupations. Nevertheless a considerable proportion of qualified electrotechnology tradespersons leave trade employment for non-trade employment. Analysis of 1996 census data (see figure 2) shows for those with electrotechnology trade qualifications:

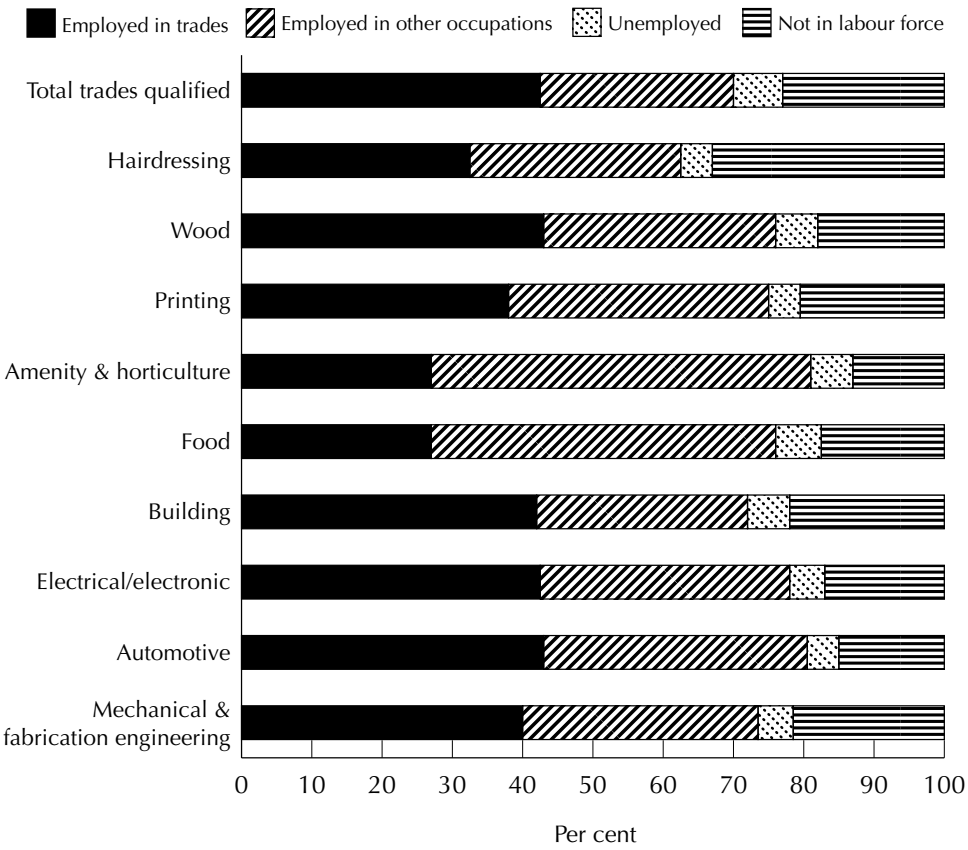
- 42 per cent were working in an electrical or electronic trades occupation
- 35 per cent were working in a non-trade occupation

- 4 per cent were unemployed
- 17 per cent were not in the labour force (includes those who retire)

The proportion (42 per cent) of qualified electrotechnology tradespersons who were working in their trade is higher than the average (38 per cent) for all trades in the Australian workforce (see figure 2).

Wastage from skilled trades can very often be mainly due to an ageing of the skilled trades workforce and high wastage rates because of the retirement of skilled trades workers. However, the wastage occurring from the electrotechnology trades is not due to a higher-than-average incidence of skilled tradespersons in the older age groups.

Figure 2: Trades-qualified persons aged 15 and over—proportion in trades employment, employed in other occupations, unemployed and not in the labour force, 1996



Note: 'Other occupations' includes occupations not adequately described and not stated
Source: Derived from ABS 1996 Census of Population and Housing data

As shown in table 11 and figure 3, DEWRSB's analysis shows that the age profile of most of the electrotechnology trades is broadly similar to the average for the total trades group. However, some electrotechnology trades have somewhat distinct age profiles:

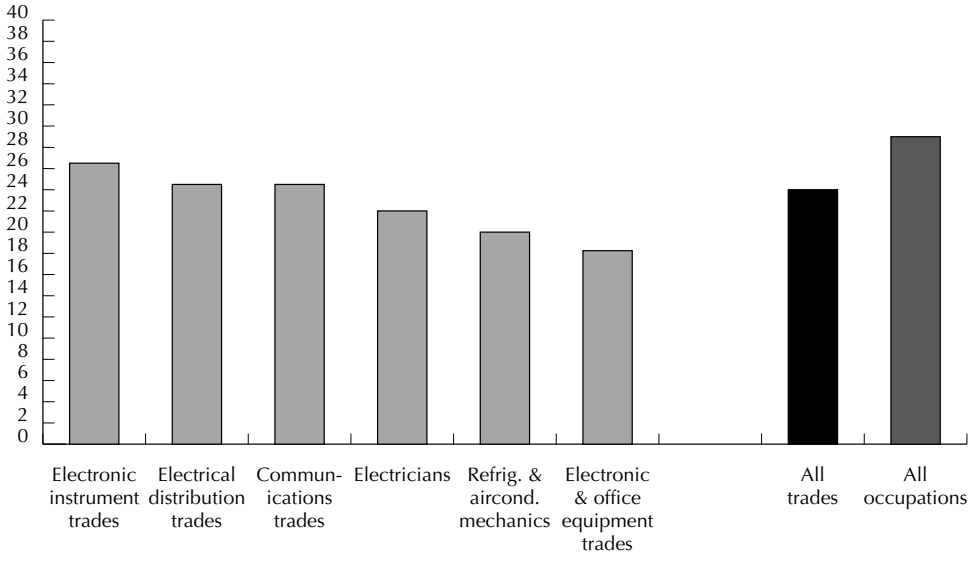
- Refrigeration and air-conditioning mechanics and electronic and office equipment trades have a lower proportion aged 45–64 years (20 per cent and 18 per cent respectively compared to 24 per cent for all trades).
- Electronic instrument, electrical distribution and communication trades have a relatively low proportion aged 15–24 years, but are overly represented in the 25–44-year-age range.

Table 11: Age profile of the electrotechnology trades (% in age group)

Occupation	Age range		
	15–24 years	25–44 years	45–64 years
Electronic instrument trades	10.1	57.4	26.5
Electrical distribution trades	7.1	68.3	24.6
Communications trades	12.6	62.1	24.5
Electricians	22.8	54.5	22.0
Refrigeration & air-conditioning mechanics	24.9	54.5	19.9
Electronic & office equipment trades	21.8	59.4	18.3
All trades	23.0	52.1	24.2
All occupations	18.0	51.6	28.8

Source: ABS, unpublished data from the 1996 Census of Population and Housing

Figure 3: Percentage (%) of tradespersons aged 45–64 years



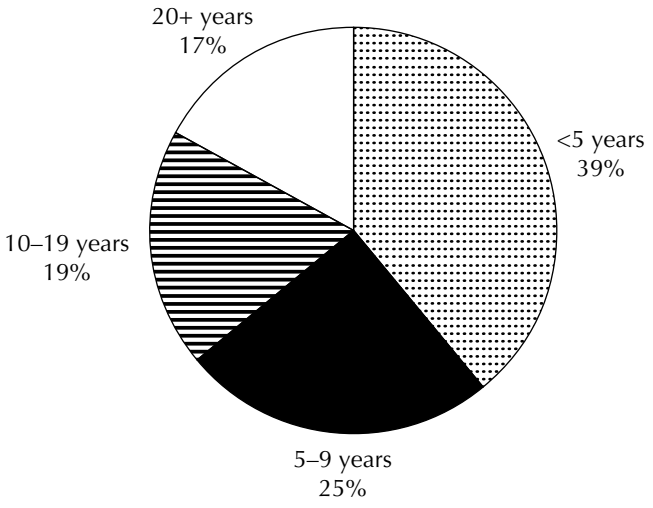
Source: ABS, unpublished data from the 1996 Census of Population and Housing

The DEWRSB analysis shows that career progression by electrotechnology tradespersons is a significant component of wastage. Almost two-thirds of the electrotechnology tradespersons working in a non-trade occupation were employed in a more highly skilled occupation. Of those moving to a more highly skilled occupation, building and engineering associate professionals, specialist managers, and managing supervisors were key areas of employment. This means that the concept of wastage is misleading here. These people are progressing to higher level occupations, often in areas related to electrotechnology.

The remaining one-third were, however, employed in less skilled occupations. There was a wide range of occupations involved with those moving to less skilled occupations. The most important of these less skilled occupations were transport drivers, intermediate clerical workers and intermediate sales workers.

DEWRSB reports there are not particularly unusual patterns in the electrotechnology trades with respect to how long people stay working in these trades. Around two-thirds (64 per cent) of electrotechnology tradespersons who left their trade did so within the first 10 years of employment in their trade, as shown in figure 4. Some 39 per cent of those who left worked less than five years in their trade. This is a similar pattern to that of the trades group as a whole.

Figure 4: Trades-qualified persons who have left the electrotechnology trades, by time in trade



Source: ABS, unpublished data from the 1996 Census of Population and Housing

The reasons why electrotechnology tradespersons leave their trade are important in any consideration of what can be done to increase the retention of skills in these trades. DEWSRB reports that, according to the 1994 ABS

publication, *Career paths of persons with trade qualifications*, the main reasons why electrotechnology tradespersons left the trade was because they were 'laid-off, or lack of work' or because they 'sought better pay, lack of career prospects or promoted'. These reasons were given by 26 per cent and 24 per cent respectively of electrotechnology tradespersons (see table 12).

Table 12: Main reason trade-qualified persons left the electrotechnology trades

	Proportion (%)
Laid-off, or lack of work	25.9
Sought better pay, lack of career prospects or promoted	23.6
Wanted a change, or dissatisfied with job	19.9
Family, personal, or ill health	11.1
More job security or sought better physical working conditions	5.4
Other	14.1
Total	**100.0**

Source: ABS 1994

The proportions of electrotechnology tradespersons giving reasons 'laid-off, or lack of work' or 'sought better pay, lack of career opportunities or promoted' were higher than for the total trades group. For the total trades group, 21 per cent cited 'laid-off, or lack of work' as the main reasons for leaving the trade and 19 per cent 'sought better pay, lack of career prospects or promoted'.

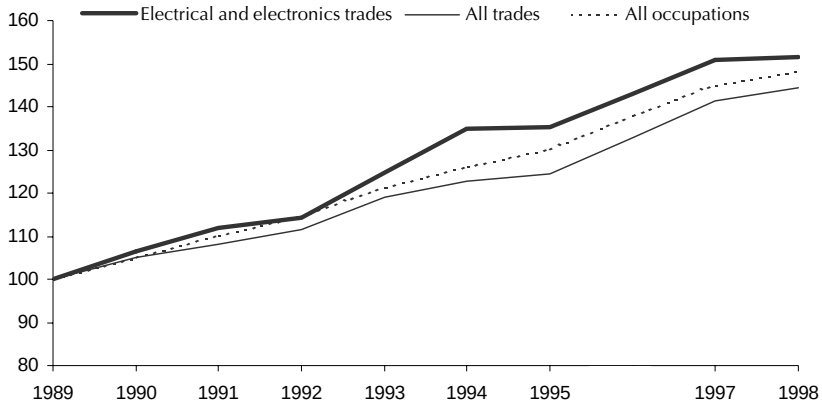
A number of factors could account for those who had 'wanted a change, or (were) dissatisfied with work'. These factors include a desire for a shorter working week.

DEWRSB also reports that there is some evidence to suggest that a significant number of those who left their trade could be enticed back. The ABS survey also showed that, of those who left the electrotechnology trades, 54 per cent would consider returning to the electrotechnology trades. This is a higher proportion than for the trades group in total. For the trades group, only 46 per cent would consider returning to their trades.

A return to the electrotechnology trades was not, however, unconditional. The extent of ready availability of trade and alternative non-trade employment is a major consideration. The other major consideration is 'better pay, promotion or improved career prospects'. This was cited by 17 per cent of potential returnees.

Despite the issues raised by people who have left the trades, it is clear that average weekly earnings for those in the electrotechnology trades have grown significantly throughout the 1990s, as shown in figure 5. Moreover, earnings in these occupations are better than other trades generally. Earnings are also better in these trades than in the workforce generally.

Figure 5: Indexed mean weekly earnings for the electrotechnology trades, all trades and all occupations, 1989–98



Source: ABS 1998

Table 13: Trade wastage projections

Trade occupation (ASCO second edition)	Wastage to 2004–05
Mechanical engineering tradespersons	⬇⬇
Fabrication engineering tradespersons	⬆
Automotive tradespersons	⬇
Electrotechnology tradespersons	⬇
Structural construction tradespersons	⬌
Final finishes construction tradespersons	⬌
Plumbers	⬇⬇
Food tradespersons	⬆
Skilled agricultural workers	⬇⬇
Horticultural tradespersons	⬌
Printing tradespersons	⬌
Wood tradespersons	⬇
Hairdressers	⬆⬆
Textile, clothing/related tradespersons	⬌
Miscellaneous tradespersons	⬇
Total tradespersons	⬌

Note: ⬆⬆ well above average ⬆ above average
⬌ average
⬇⬇ well below average ⬇ below average

Source: Wastage projections prepared by the Monash University-ACER Centre for the Economics of Education and Training, under contract to DEWRSB

Wastage from the electrotechnology trades in general, is projected to be relatively low and to be lower than trades generally, as shown in table 13. Therefore, wastage from the electrotechnology trades in the next few years is likely to be a smaller problem than for other trades in the Australian economy.

The implications of the wastage of skills from the electrotechnology trades workforce on the overall supply of skills to these trades is summarised in box 6.

Box 6: Implications of skills wastage from the skilled electrotechnology trades workforce

- The electrotechnology trades have been more successful than other trades in retaining qualified persons within the skilled trades workforce. Some 42 per cent of qualified electrotechnology tradespersons are working in their trades, compared with only 38 per cent for other trades.
- Of those now not working in an electrotechnology trade, the majority are working in other areas of the labour market, rather than having left the labour market or becoming unemployed.
- The majority of those leaving to work in other jobs (that is, almost two-thirds) have gone onto more highly skilled/managerial positions, despite the fact that earnings in the electrotechnology trades are better than other trades and above national average earnings.
- Forecasts are for low wastage rates in the future.
- There is some potential to lower net wastage rates from these trades, since 54 per cent who have left say they would consider returning with improved pay and career prospects, a figure which is significantly higher than the 46 per cent from other trades who say they could be induced to return to their trade.

4 Employers' recent experience of skill shortages in the electrotechnology trades

THE EVIDENCE PRESENTED in this report suggests that the combination of commencements in new apprenticeship training and the now very significant set of non-apprenticeship training pathways to the electrotechnology trades has been sufficient to keep up with overall employment growth in the electrotechnology trades. This situation has been aided by electrotechnology trades having:

- better earnings and career prospects than other trades
- lower rates of wastage from the trades than other trades
- higher levels of qualified persons in the trades workforce

Nevertheless, it is also clear that the preconditions for skill shortages are arising in some areas. This is particularly the case in some rapidly expanding areas such as in the electronics and telecommunications occupations. The factors suggesting these preconditions for the existence of skill shortages are:

- forecasts of electrotechnology trades employment growth at a faster rate than in the past and at a faster rate than for many other trades
- overall, a relatively low 9 per cent of the electrotechnology workforce being made up of new apprentices in training despite the projected increased demand for skills in these trades
- very low levels of new apprentice training (that is, at just over one per cent of the trades workforce) in some key emerging electronics and telecommunications trades
- relatively low rates of growth of new apprentice completions
- the severe limitations of migration as a source of skills for these trades because of high levels of global demand for electrotechnology skills

These factors have led to employers recently reporting increased skill shortages. This is discussed below.

4.1 Vacancy growth

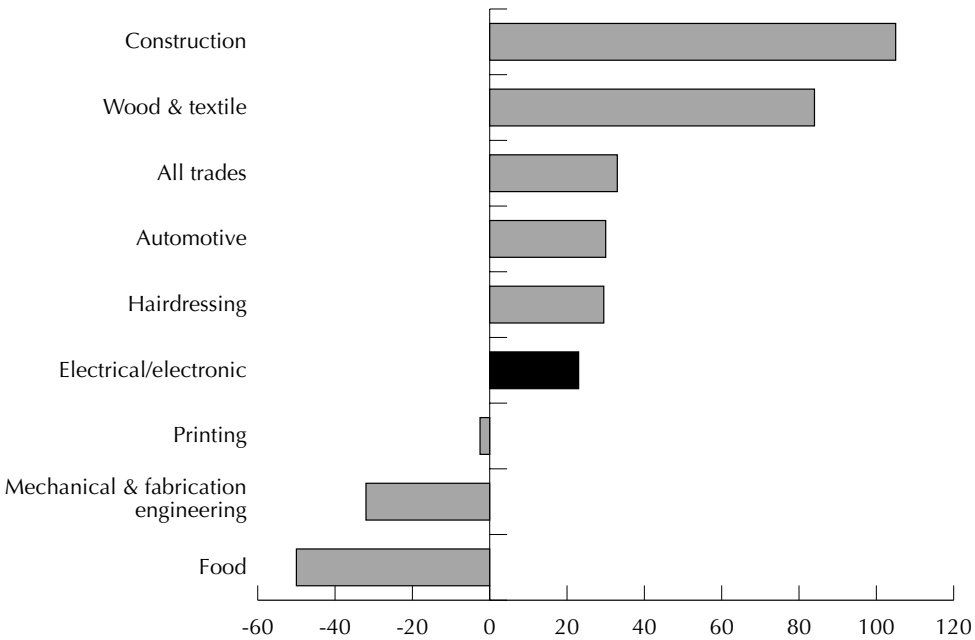
Job vacancies for electrotechnology trades have increased in the past two years, but not as strongly as for the total trades group, which was heavily influenced by strong growth in the building and construction trades.

DEWRSB carries out a periodic skilled vacancy survey. From the survey a rise of 22.8 per cent in vacancies for the electrotechnology trades was recorded over the two years to October 1999. This growth in vacancies is smaller than the 32.8 per cent rise over the past two years recorded for all skilled trades as shown in figure 6.

Nevertheless, the key point is that reported vacancies in the skilled electrotechnology trades are now expanding rapidly, at a rate that is far outstripping the growth in skilled trades employment in the electrotechnology trades.

Information from the labour market survey of apprentices survey undertaken by DEWRSB in mid-1998 indicates that there are sufficient suitable applicants for electrical apprenticeships, but that there was considerable tightening between 1997 and 1998. The number of suitable applicants for apprenticeships in the electrical trades fell from 6.0 per apprentice recruited to 3.9.

Figure 6: Growth in trades groups and total trade vacancies over the two years to October 1999



Source: Data supplied by DEWRSB, from the skilled vacancy survey

Some tightening was also evident from group training company apprentice recruiting with the ratio of suitable applicants falling from a quite low 2.7 per apprentice recruited to 2.2. Moreover, the youth labour market has tightened

further since the survey was undertaken, and finding suitable applicants for the intakes in future years could be more difficult, especially in Sydney where many alternative career opportunities are available.

4.2 Employer experiences and perspectives

DEWRSB's recent assessment (of the period September to October 1999) of skill shortages in the trades shows that shortages of two of the electrical trades are currently widespread in Australia. These trades are for electricians and refrigeration and air-conditioning mechanics. DEWRSB assessments by State and Territory are outlined in the table below.

Table 14: Electrical trades skill shortages by State and Territory[(a)]

Tradespersons	NSW	VIC	QLD	SA	WA	TAS	NT	National
Electricians	S		S	R		S		
Refrigeration/ air-conditioning mechanics	S	S	S	S	ss	S		N

Note: S = Statewide R = Regional ss = Seasonal N = National
[(a)]As assessed by DEWRSB

Skill shortages for electricians and refrigeration and air-conditioning mechanics are easing in New South Wales, particularly in Sydney with the completion of the electrical trades work for the Sydney Olympics. On the other hand, shortages are widening in Victoria, since there is an increasing number of hotels and retail food outlets in Victoria under development or being upgraded. This, together with ongoing development in large retail shopping centres, has resulted in increasing demand for refrigeration and air-conditioning mechanics in Victoria.

While residential construction activity has been strengthening, and non-residential construction activity has also shown strong growth, the resource sector is experiencing a downturn. Consequently, in Western Australia only seasonal shortages are evident for refrigeration and air-conditioning mechanics. Subdued mining and construction activity is also limiting demand for electrical trades in the Northern Territory. No electrical trades are assessed as being in shortage in the Northern Territory, and shortages in Tasmania are numerically small.

Recent intelligence work by DEWRSB shows an easing of recruiting difficulty for electrical trades in New South Wales and varied situations in other States. In New South Wales, around 90 per cent of employers in Sydney and 70 per cent of employers in regional areas were able to fill vacancies for electricians within four weeks in mid-1999, compared with only 60 per cent for the State as a whole a year earlier. This in large part reflected progress with the Sydney Olympic site at that time. A similar situation was evident for refrigeration and air-conditioning

mechanics, with 75 per cent of employers being able to fill their vacancies within four weeks, compared to just 40 per cent last year.

In Victoria, some 90 per cent of employers were able to fill vacancies for electricians within four weeks, but 40 per cent were not able to fill vacancies for refrigeration and air-conditioning mechanics.

In Western Australia 90 per cent of vacancies for electricians, almost 95 per cent of vacancies for electronic instrument, and all vacancies for refrigeration and air-conditioning mechanics were able to be filled. In Tasmania, employers report that electrician vacancies are becoming harder to fill, particularly for smaller employers.

The National Electrical Contractors' Association has carried out a telephone survey of its members in December 1999/January 2000. A sample of 95 member companies was asked whether or not they were involved in particular sectors and, if so, whether they were experiencing skill shortages in those sectors.

As shown in table 15, electrical contractors are reporting skills shortages far outstripping situations of skills being in balance or oversupply across all sectors of work. In most sectors at least 70 per cent of companies are currently experiencing at least some shortages in electrotechnology skills.

Table 15: Electrical contracting companies experiencing skills shortages, December 1999–January 2000

Sector	Proportion of companies reporting involvement in the sector (%)	Of those companies involved in the sector, proportion reporting			
		Is a shortage (%)	Supply = demand (%)	Is an over-supply (%)	**Total (%)**
Major commercial contractor work	61.0	70.7	19.0	10.3	**100.0**
Industrial work	76.8	79.5	17.8	2.7	**100.0**
Domestic household work	55.8	77.3	18.9	3.8	**100.0**
Voice and data communications work	42.1	72.5	22.5	5.0	**100.0**
Building, construction and other low voltage specialists	36.8	82.9	17.0	0	**100.0**
Resource projects	24.2	56.5	39.1	4.4	**100.0**

Source: NECA survey of electrical and communications contractors

DEWRSB reports that the prospects for any continuing skill shortages in the electrotechnology trades depend on developments in key industries.

Construction and manufacturing industries are both subject to cyclical swings in employment. Manufacturing employment declined over the year to August 1999 but construction employment grew strongly. Construction activity has since eased following completion of the Sydney Olympic site and the introduction of the goods and services tax.

Wholesale and retail activity is heavily reliant on consumption behavior. The level of consumer consumption has been strong in recent years and is likely to persist given continuing good economic performance.

The 1999–2000 budget forecasts predicted continuing subdued activity in the mining sector, following a number of years of quite strong growth up to 1997–98. In the short term the present relatively low level of demand from this sector should limit prospects for electrical trades shortages in Western Australia and the Northern Territory.

Nevertheless, a continuation of strong economic growth means that electrotechnology trades shortages are expected to persist in the short term. Shortages would expect to become more widespread if relatively strong economic growth is sustained over the medium term. Any resurgence in resource projects would further strengthen demand for electrotechnology trades.

A summary of employers' experiences with skill shortages in the electrotechnology trades is given below in box 7.

Box 7: Employers' experiences of electrotechnology trades skill shortages

- The Department of Employment, Workplace Relations, and Small Business skilled vacancy survey shows a 23 per cent growth in electrotechnology skilled vacancies over the past two years, a smaller rise than for all trades.
- The National Electrical Contractors' Association reports some 70 to 80 per cent of members are experiencing at least some skill shortages across most sectors.
- DEWRSB reports that some of the electrical skill shortages have eased recently with the completion of Olympics construction projects and in response to some resource sector slowdowns resulting from the Asian economic crisis. In some electrical areas a higher proportion of employers is able to fill their skilled vacancies within four weeks than was the case a year earlier.
- The labour market for apprentices has tightened with the number of suitable applicants for each apprentice recruited in the electrical trades falling from 6 to 4 between 1997 and 1998.
- Nevertheless, skills shortages in some electrotechnology trades are widespread.

5 Conclusion

DETERMINING THE EXTENT of skill shortages is not an exact science. The evidence presented here suggests some skill shortages are emerging in Australia's skilled electrotechnology trades. The telecommunications trades are an area that warrants particular attention.

In relation to new apprentice training, the evidence suggests that while numbers commencing new apprenticeship training might need to rise to keep up with projected demand and wastage, an issue which is equally critical concerns increasing retention in new apprenticeships. Strategies for improvement really need to be focussed on measures to ensure a greater proportion of those who start a new apprenticeship finish it, rather than on measures to rapidly increase the numbers coming in in the first place.

This report also suggests that, in the future, employers in the electrotechnology industries will increasingly have to look further than teenagers for new entrants to electrotechnology new apprentices. The number of young people aged 15–24 years will stagnate in Australia over the coming decades. This means that shifting the focus on attracting new apprentice entrants from teenagers to those aged in their early 20s will not be an adequate strategy in the future: older people will have to be considered as a major source for skills for these industries. Developing alternative pathways to the traditional apprenticeships will be critical, noting that today there are now more people undertaking training in electrotechnology skills in the VET system in non-apprentice programs than there are in new electrotechnology apprenticeships.

The analysis in this report suggests that even more critical than increasing the numbers in training will be the issue of the relevance and quality of training for existing workers, as well as new entrants, to the electrotechnology trades. Continuous skilling of the entire skilled trades workforce and making sure that the content and coverage of training is able to keep apace of the rapid rate of technological change in electrotechnology, is perhaps the biggest challenge of all in the quest to meet Australia's rapidly changing electrotechnology skill needs.

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ISBN 0 87397 636 3 print edition

ISBN 0 87397 637 1 web edition