

NATIONAL

Careers in the electrotechnology industry

The industry – perception and reality

The electrical industry, like the product it deals with is in many respects invisible. All of us have come to rely on electricity; we expect it to be there at the flick of a switch. It's only when something goes wrong that we actually realise how important electricity is to the way we live.

August 2003 – N.E. America blackout!

In August of 2003 a short circuit in the American State of Ohio, caused by trees coming into contact with power lines, set off a chain reaction that eventually led to a power failure that lasted for up to 30 hours, spread across seven States and affected 50 million people.

As well as having an impact on all of the things that rely on electricity in the home (TVs, refrigerators, air-conditioning, cooking, lights, computers etc, some of the other effects of this blackout included:

- 10 major airports shut down
- over 400 flights cancelled
- 9 nuclear power plants shut down
- thousand stuck in lifts or elevators
- tens of thousands stuck in subways
- trains simply stopped where they were
- every traffic light failed
- commuters were forced to walk home
- restaurants and theatres closed
- Major sporting events cancelled
- Casinos shut down
- Looting in Ottawa
- Factories shut down
- ATMs stopped working
- Computers and networks crashed
- Telephone systems collapsed
- Water supplies failed (pumps require electricity)
- Miners trapped underground without ventilation
- Hospitals switched to emergency generators
- Emergency services & prisons severely disrupted.

This incident, costing many millions (some say billions) of dollars, is a reminder of the extent and importance of an industry that we all rely on to an enormous degree.

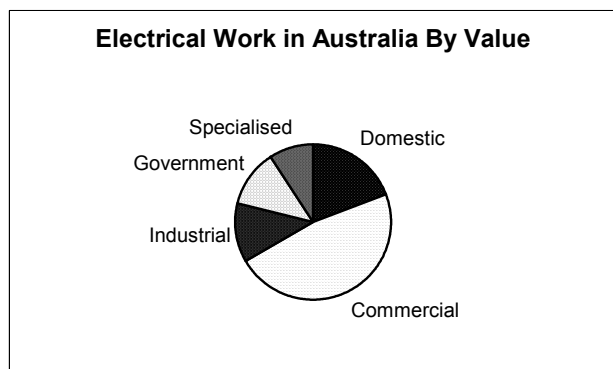
Electrotechnology is now the world's largest industry and is a major employer in all regions of Australia and overseas. The industry provides a wide range of jobs in areas such as power generation, distribution, installation, servicing, repair, maintenance and customer service. There are jobs for new entrants to the industry ranging from those just finishing school to those with specialist university level qualifications.

The industry in Australia

Most people think that electricians work mainly in the residential or housing sector. This is understandable because it is where we are most likely to recognise an electrician at work. Whether we build a new house, renovate an old one or simply have a new appliance installed, we use electricians. They help us plan, install and maintain power points, lighting, heating, air conditioning, computer networks and security systems.

Fact: there have been cases where the electrical work on an individual home has cost over a million dollars!

It often comes as some surprise to find that the residential electrician is only a very small part of the electrical industry in Australia – less than 20 percent if you include the development of new project homes.



The electrical industry is responsible for all of the electrical work done in Australia, and so the work an electrician does will vary greatly according to the sector they are working in and any special skills they may have.

The domestic sector

Domestic electrical work includes the installation, service, maintenance and repair of electrical systems in new and old homes, housing estates, caravan parks, apartment blocks, residential villages and so on.



Electricians install lighting, power points and fixed electrical appliances (such as ovens, water heaters and centralised heating and cooling systems).

Increasingly, domestic electrical work includes the design and installation of Smart Wired™ technology. This is where things such as lighting, power, air conditioning, heating, blinds and curtains, sprinklers, security, doors, lifts, home theatres, multi-room audio and Closed Circuit TV cameras can be integrated and controlled using things such as touch screens, computers, telephones and mobile phones.

Currently most Smart Wired™ technology is installed in new homes while they are being built, however, in the future more and more people are likely to want their existing homes ‘retro-fitted’ so that they can enjoy some of the advantages that new technology brings with it.

The commercial sector

Commercial electrical work involves providing electrical services to commercial enterprises such as shops, office blocks, hotels, universities, theatres, hospitals, schools, sporting complexes, cinemas, radio and TV studios.

It ranges from small-scale installations in individual offices or shops to much larger scale operations such as shopping centres, airports and sporting arenas.



As is the case in every sector, the supply and distribution of electricity is largely unseen and, therefore, is not always thought of.

However, imagine being in a shopping centre, airport or hospital without electricity – it just doesn’t work

Specialisations in the commercial sector can include lifts and elevators, heating and air conditioning, closed circuit television, security surveillance and fire protection.

The industrial sector

Electric power is the basis of all modern industry. Its ready availability is absolutely essential for its smooth operation. As well as being responsible for the uninterrupted supply of lighting, power, heating and air conditioning and being the provider of energy for industrial production, electricity is also essential to the systems that control machines and allow for the processes of industry to be monitored and controlled.

Electricians working in industry are required to install, overhaul, maintain and repair all kinds of industrial equipment, including assembly lines, robots and back-up power supplies.

Electricians employed in the industrial sector can find themselves working in small and large workshops and factories of all sizes. They are essential for the operation of food processing plants, newspaper printing presses, car plants, ship yards, mine sites, oil rigs, power stations, steel mills and any other factory you can think of.



Because of the huge investment in modern industry it is absolutely essential that production is able to go on uninterrupted – in some cases, a stoppage in production can mean the loss of thousands of dollars each hour.

Industrial electricians are often required to work shifts or at times when industry is closed down to enable maintenance to be carried out at times when production will not be interrupted. They can also find themselves ‘on call’ at weekends or at other times when they are needed to attend to any emergencies that may arise.

The government sector

Electricians working on government projects perform similar work to those working in other parts of the industry. They are involved in the installation, service and repair of electrical and communications systems in a wide range of government locations such as:

- Defence Force bases (including ships and submarines)
- Government departments
- Museums, art galleries
- New and existing government schools
- Australian Embassies and Consulates
- Road lighting and signaling
- Prisons, courts and police stations.

With many government projects, security of supply and security of information can be a major concern as government agencies must be able to be relied on their electrical and communications systems in times of national and international emergencies. For example, security of electricity supply (including reserve power generation) is required to ensure that work can continue without interruption and security of data and communications may be necessary to keep government secrets.



Electrical installations at the Australian Embassy in Beijing were carried out by an Australian company.

Specialised electrical services

This involves providing specialised electrical and communications services to a range of customers in the domestic, industrial, commercial and government sectors.

While most electrical contractors provide a wide range of electrical services to their customers, some may concentrate their business in only one or two specialist areas such as lifts and elevators, fire protection services, voice and data communications, computer networks, security systems and maintenance.

So, for example, an airport or shopping centre may use one electrical contractor to carry out their general electrical work (such as supply of lighting and power) but rely on a specialist company to look after its lifts, elevators and moving walkways. They may call on other specialist companies to fix their heating and air conditioning systems and still others for fire protection and closed circuit television surveillance.

Other electrical contractors might specialise in providing services to only one particular industry such as power generation, mining, railways, tramways or telecommunications.

Opportunities in electrotechnology industry

The electrotechnology industry involves working with all aspects of electrical, electronic and communications technology. It's a global industry and can offer a wide range of employment opportunities to everyone from school leavers to university graduates and people interested in a career change.

Many jobs in electrotechnology are very specialised and can only be carried out by people who have had extensive training and who have the appropriate licences. Other jobs may require less training but in these cases work and opportunities for career advancement may be restricted. However, in order to keep up with the pace of technological change, the industry offers the prospect of a wide variety of further training options and the chance to continue to develop in one or more of the specialised career pathways in the industry.

Work locations

Where you work will depend on the exact nature of the job you do, however, jobs in this industry are available just about everywhere that electricity is used. So, you could work anywhere in Australia or overseas. You could even find yourself working on board cruise ships or at one of Australia's Antarctic bases.

Within Australia you could work in locations such as:

Airports	Railways	Power stations
Mine sites	Tramways	Schools
Defence Force bases	Universities	Street lighting
Water treatment	Hospitals	Offices
Government buildings	Museums	Cinemas
Department stores	Workshops	Ski fields
Sporting arenas	Freeways	Hotels
Shopping centres	Factories	Shipyards
Emergency services	Theatres	Private homes

Safety

Electricity is shockingly dangerous! This may be because it is both invisible and all around us, so people often forget just how deadly it is.

The electrical industry has many rules and regulations to ensure the health and safety of electrical workers and the general public. In general, this is achieved by ensuring that people carrying out electrical installations are qualified and that electrical equipment and appliances meet any appropriate safety standards.

Technological development

Electrotechnology is changing so rapidly that it is often difficult to keep up with new developments. So, the electrical tradesperson has to be adaptable and able to keep learning, because they will be dealing with such things as microelectronics, photonics, industrial and scientific instrumentation, telematics, fibre optics and a whole lot more.

At the moment this means that to become a qualified electrician you must complete a four-year apprenticeship. In some states it may also be necessary to pass an electrical safety assessment. Once these criteria have been met you can apply to the appropriate State body for an electrician's licence. Once the application has been approved you are able to work unsupervised as an electrician.

The apprenticeship

To become qualified as an electrician you must complete a four-year apprenticeship. This will combine both on-the-job experience and off-the-job training. In the first year you will probably spend four days a week working for your employer and one day a week at a training centre. By your fourth year you will be working full time for your employer.

The type of work you do as an apprentice will vary depending on the project you're working on. It will also vary over the time of the apprenticeship. As you gain more skills and experience you will be able to undertake more complex tasks. However, throughout your apprenticeship you will always be working under the direct supervision of a qualified electrician. By the time you have completed your apprenticeship you should be competent in all of the skills required of a licensed electrician.

But remember, electrotechnology will continue to change and develop throughout your working life and, as it does, you will need to upskill, adapt and learn.

Pay

Generally, pay and conditions in this industry are very good. However they will vary according to the particular job you do, where you work, your qualifications and how much overtime you work (if any).

To find out how much electricians and apprentices are paid in your area or the rates of pay for particular employers you should visit the Workplace Authority website at www.workplaceauthority.gov.au

How electrical businesses are organised

Electrical contracting is the business of providing electrical and communications services. This means that anyone who wants to run an electrical business must become a Licensed Electrical Contractor.

Contractors range in size from one-person businesses (sole traders) to multinational companies that employ hundreds of people. In fact, electrical contracting is a great option for people wanting to start their own business.

Of NECA's members throughout Australia only approximately two percent are classified as large businesses that employ more than 50 people. However, it should be remembered that some of these companies are very large indeed and have contracts each year running in excess of \$100 million. These businesses are very far removed from the image of the domestic electrician but they are rarely thought of by young people trying to enter the industry.

Is electrotechnology for me?

Good career advice is often just plain old common sense: "If you faint at the sight of blood, don't become a nurse. If you dislike children, forget about becoming a Teacher."

Jobs in the electrotechnology industry are not for everybody. If you want a successful career you should be looking to match your aptitudes, skills and interests with the work you are likely to be doing. In short, look for a career that allows you to match your own preferences and abilities and the lifestyle you want with the job you do.

To be successful in the electrical industry you will need to:

- be practical
- be able to work at heights and in confined spaces
- have excellent communication skills
- enjoy Maths and problem-solving
- be able to adapt to new technologies
- be prepared to work hard
- be responsible, reliable and dependable
- continue learning throughout your working life.

If you do have the characteristics outlined above and want to join this industry, then you will need to start thinking about finding an apprenticeship.

But remember, electrotechnology will continue to change and develop throughout your working life and as it does you will also need to upskill, adapt and learn.

Job seeking advice

Despite the fact that there is an acute skills shortage in electrotechnology, making a start in the industry can be quite difficult. This is partly due to the fact that taking on an apprentice now will not solve a skills shortage problem for several years.

To start an apprenticeship you need to find an employer willing to take you on, and this is possibly the hardest step. Employers will be investing time and money into your training and so will be looking to employ the best applicant they can find.

You can start by looking for advertised vacancies in the daily press, local newspapers and on the Internet. However, it is important to realise that many jobs never get advertised. Some people may employ an apprentice as a result of 'cold canvassing' (being approached directly by a job seeker), by having someone referred to them or by asking a school, training company or TAFE if they have a suitable candidate.

Many employers use tests to try to discover whether an applicant has the ability to cope with the off-the-job training they will have to do. This will usually occur as part of the selection process. In Victoria and South Australia, NECA provides the opportunity for applicants to sit a Pre-employment Test. The test is usually held in October of each year and the results are made available to electrical contractors who are looking for an apprentice. Some employers will use the results of that test to approach interested young people.

You can also start actively searching for employment by locating electrical and/or communications contractors in your area. There is a Contractor Search facility on the NECA website which can be used to identify contractors who operate from your local area (or from areas close by).

Telephone the company and ask if they are taking on apprentices in the near future. Tell them that you would be interested in being considered for a position and ask who to send your resume to. Follow up by sending a cover letter and resume to the appropriate person.

What employers want

You need to make sure that you can demonstrate that you have the qualities required by employers in the industry.

This can be done by preparing a resume, or CV that shows you have:

- successfully completed some level of secondary school education (Year 12 preferred)
- an interest in the industry, perhaps demonstrated by work experience, school or home projects
- effective Mathematics and English skills
- a positive attitude towards work
- a sense of responsibility.

In your resume or CV you might like to refer to past employment experience, school reports, hobbies and pastimes. It can be supported by references from employers, teachers and community leaders.

A driving licence is also desirable, as work in the industry often requires travelling from job to job.

VET in Schools

Completion of a related VET in Schools program or technology based studies will provide an opportunity to demonstrate your aptitude and interest in this field. Photos of completed projects can be included in the resume and you will also have something practical to talk about in any interview situation.

Pre-apprenticeship programs

Regardless of whether you have finished Year 12 or not, the completion of a pre-apprenticeship program is also an advantage. This demonstrates to an employer that you have completed basic training in the industry. They will know that you have basic skills using hand tools, understand some electrical theory and have completed an Occupational Health and Safety program. It also means that the employer does not have to pay you for off-the-job training during your first year. Contact your local TAFE or Group Training Company to find out if this option is available through them.



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