energyskills queensland

ELECTRICAL CONTRACTORS INDUSTRY WORKFORCE PLAN 2012 - 2017

MAY 2012

Energy Skills Queensland (ESQ) is the Industry Skills Body promoting career pathways, jobs and workforce development for Queensland's energy and telecommunications industries. Energy Skills Queensland is at the forefront of developing solutions to help industry plan and develop their workforce, and providing opportunities for organisations and individuals to improve workforce skills by brokering training funding.

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ELECTRICAL CONTRACTORS INDUSTRY WORKFORCE PLAN

REPORT SUMMARY

This is an exciting and challenging time in Queensland's history. The state, along with the nation, is in one of the largest periods of prosperity with over $70billion in capital investment being made in QLD in 2011. To understand which skills are needed to deliver the upcoming electrical projects in the domestic, commercial, construction, industrial and infrastructure sectors in QLD, JETCO commissioned an electrical contracting industry workforce plan to determine the skills development needs in order to respond to future growth. Energy Skills Queensland is pleased to present the findings in this report, and to offer workforce development strategies to address the emerging skills gaps faced by the electrical industry over the next five years.

There are a number of key issues facing the electrical contracting industry, which are summarised as:

- Resources and mining boom in Queensland and across Australia
- Ageing population of licensed electrical contractors
- Reduced apprenticeship numbers over the last decade impacting the number of skilled electricians
- Demand from building construction, particularly in regional areas
- Impact of natural disasters
- National occupation licensing
- National harmonisation of workplace health and safety regulations on small and medium sized businesses.

These factors underpin the sector overview for the electrical contracting industry, at a state, national and international level. Key challenges the industries are facing are reviewed in this report, and take into account such concerns as Queensland's energy and resources boom; growth within the energy sector and within other Australian industries e.g. mining; increasing technological changes; as well as changing workforce profiles i.e. # of apprentices, ageing population, shortage of technical trainers.

Scenarios will be used as the foundation for forecasting supply and demand for each critical skills set. Scenarios focus on the joint effect of many factors and provide the most plausible views of the future of an industry or sector. They help to identify major events i.e. political, social, economic, technological, environmental, regulatory, that will shape what the future might look like and therefore help us to understand the impact the future will have on skills needs and development within our industry. It also helps us to anticipate any current weaknesses or inflexibilities that may need to be addressed.

SUMMARY OF KEY FINDINGS

Projected shortages of licensed electricians

The low, medium and high growth scenarios can be summarised as (for a full list please see appendix one):

LOW:	Base program of work: only committed programs go ahead
MEDIUM:	Increase of planned program of work: All committed programs + additional 20% of planned projects
HIGH:	Super Boom: all committed programs go ahead + additional 60% of planned projects

Using the scenarios stated above to define forecasting parameters, ESQ has identified that under a medium growth scenario there is expected to be a shortfall of approximately 7,600 licensed electrical workers in QLD. This shortfall is cumulative over the next five years, to 2017 (see Figure 1). This is an alarming figure, which highlights the need for immediate investment in training and development of electrical workers across all sectors of the industry in Queensland. The 10 year projections for electrical workers indicate the increasing skills gap for licensed electricians is demand driven, predominantly from the mining and resources sectors, however the ageing population of electrical workers and the under-investment in apprenticeships is further compounding the skills gap.

The assumptions which underpin the low, medium and high growth scenarios are outlined in this report. Workforce projections are detailed for the medium growth scenario, where there is expected to be a significant shortfall of licensed electrical workers and is most likely to occur during the forecast period to 2017.

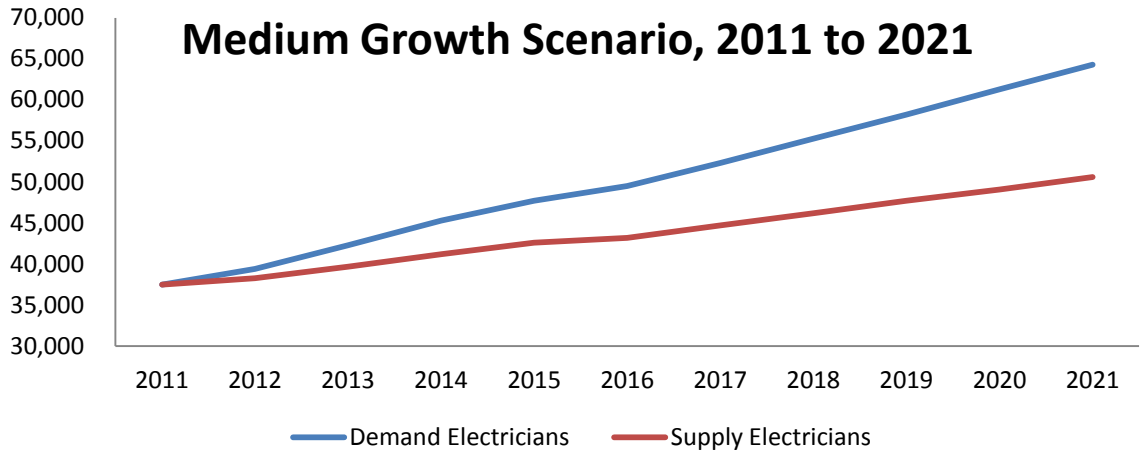

Figure 1: Queensland licensed electrical worker demand and supply projections – MEDIUM Growth

Table 1: Queensland licensed electrical worker demand and supply projections – MEDIUM Growth

Projected	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
Demand	37,500	39,400	42,300	45,300	47,700	49,500	52,300	55,300	58,200	61,300	64,300
Supply	37,500	38,300	39,700	41,200	42,600	43,200	44,700	46,200	47,700	49,100	50,600
Gap	-	-1,100	-2,600	-4,100	-5,100	-6,300	-7,600	-9,100	-10,500	-12,200	-13,700

Demographic Profile of Electricians and Apprentices

The supply of electrical workers is impacted by age profiles and apprenticeship commencement and completion numbers, which will have a high impact on the ability to reduce the projected shortage of licensed electrical workers over the next five years. Figure 2 highlights the ageing population of licensed electrical workers in QLD, and shows that over 45% are over the age of 45 years.

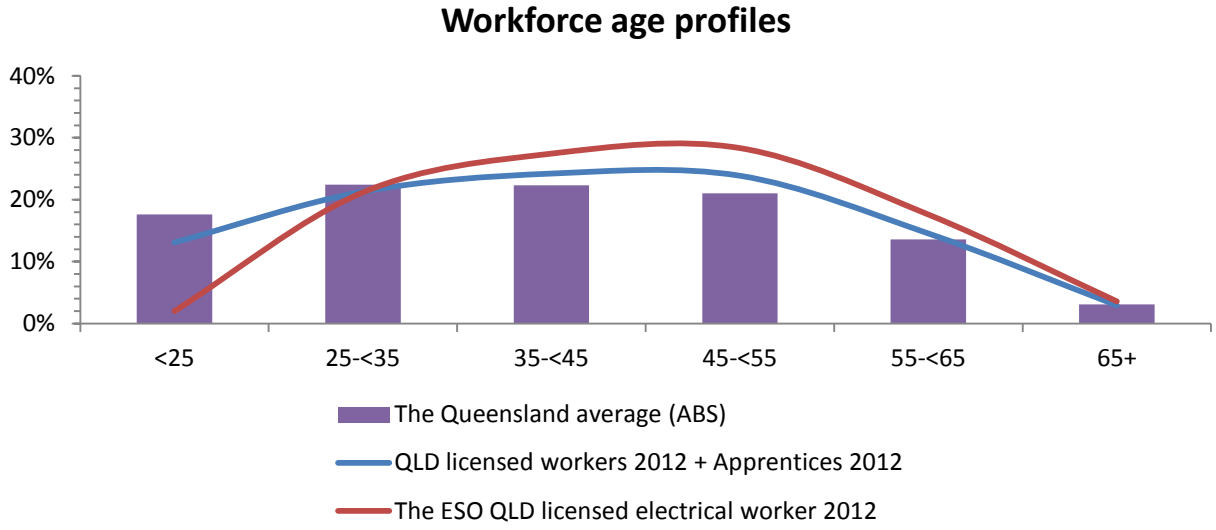

Figure 2: Queensland workforce age profile compared to the QLD licensed electrical worker

There are currently 44,000 licensed electrical workers in Qld, with an additional 10,000 holding restricted licences. It can be approximated that the number of practicing licensed electrical workers is closer to 35,000 given the large number of licensed workers not actively working on the tools.

The number of enrolled electrical apprentices in Qld, as at March 2012, is approximately 7,500 students. This means that currently there is a ratio of 5 trades' people to every 1 apprentice. Table 2 shows the average cancellation rates of students over the past 5 years, which have remained steady over time. The largest drop-out rate of students is in their second year of studies (14%), but the figures reveal alarmingly high drop-out rates right through to the fourth year of training. A potential reason for the increase of cancellations in 2nd year is the introduction of more advanced electrical theory which requires a high level of mathematical aptitude. Without mentoring, coaching or mathematical bridging programs, those apprentices who may not have studied the right level of maths previously will exit this system.

Table 2: Average cancellation rates of students per year of study, over the past 5 years

	1st year	2nd year	3rd year	4th year	5th year	Total
Average cancellation rates*	7%	14%	9%	5%	1%	36%

(*as percentage of the number of commencements)

Research conducted by ESQ in 2009 on non-completion rates of apprentices identified correlations between employer behaviour and cancellation rates. The research indicated that poor recruitment and selection techniques increased the likelihood of drop-outs, with only 1 in 14 businesses surveyed undertaking rigorous selection process. The top five responses were for cancellations were:

- Employer Terminated Contract (22%)
- Low Pay (11%)
- Poor access to training and mentoring in the workplace (10%)
- Received a better job offer – More money (10%)
- Did not meet my expectations (8%)

Following an individual's cancellation, only 33% recommenced an electrical apprenticeship and a further 10% were working as trade assistants.

Given the average completion rate of electrical apprentices is currently at 64%, a figure of 5,000 apprentices is a more realistic number of expected completions during the forecast period (2012 – 2016). This a very low figure considering the upcoming industry skills needs and the ageing workforce. Over the forecast period of 5 years to 2017, ESQ expects that approximately 1,500 additional apprentices will complete based on the number of new apprentices starting in the upcoming year. This would bring the total supply over 2012-2017 (5 years) to 6,500 electrical workers. This number has been included in the supply forecasts (current workforce + completion #'s – retirements).

Table 3 shows the number of apprentices in training by age group, in 2006 compared to 2010. The data indicates there are more apprentices currently in training when compared to 2006 which is a positive trend. However, based in the supply and demand gaps outlined in this report, it can be assumed that the current numbers of apprentices are not sufficient to meet the demand requirements in the energy sector in QLD over the next 10 years.

Table 3: Apprentice numbers by age group, 2006 & 2010 (NCVER, 2010)

	2006	2010	2006 (%)	2010 (%)
<20	2,486	2,360	38%	29%
20-<25	2,527	2,812	38%	35%
25-<35	1,122	1,778	17%	22%
35-<45	373	786	6%	10%
45-<55	95	295	1%	4%
>55	24	57	0%	1%
Total	6,627	8,087		

Interstate and Overseas Migration

Interstate Migration

Whilst we do not have a lot of data to indicate the movement of electrical workers between states, it has been suggested by a number of the stakeholders we have spoken to that there are concerns about the difficulty of bringing interstate electrical lineworkers into QLD. This is due to the constraints associated with recognition of interstate

licences, and the QLD Electrical Safety Act was sighted as the biggest barrier to bringing interstate electrical lineworkers into QLD. It was also purported that it is currently much easier to take electrical workers out of QLD than it was to bring them into QLD from other states. If correct, this raises questions about the ease of other states to 'poach' QLD workers, and the impact this could have on the supply of critical skills needed in the ESI and related industries in QLD. This will be further exacerbated by the delay in the National Occupational Licensing Scheme (NOLS) being delayed in its introduction. The provisional date of June 30, 2012 is unlikely to be met with a number of States putting their support for the scheme on hold.

Impact of 457 Temporary Migrant Visas

Currently, the number of migrant electrical workers being brought into QLD by means of 457 visas is very low. In the financial year 2010/11, the Electricity, Gas, Water and Waste Services Industries sponsored just 1.7% of the total 457 visas granted in QLD. This figure was even lower for the total sponsored across Australia, equalling 1.5% of the total visas granted (Subclass 457 State/Territory Summary Report, DIAC, 2011).

It is also important to note that whilst there are organisations in QLD sponsoring electrical workers through the 457 scheme, these numbers are too low to make the top 15 nominated occupation list. Of the countries that electrical workers are being employed from through the VET assess scheme, the Philippines and Poland seem to be the most accessible due to availability of labour, and levels of written and spoken English. However, it has been suggested that this labour pool is also decreasing due to competition from other countries, and recent recruitment drives have been yielding a reducing number of suitable applications from this region.

Scenarios

After extensive stakeholder engagement across the industry sectors, ESQ have identified three plausible scenarios for the period 2012 – 2017. The forecasting of demand and supply of licensed electrical workers is based on the scenarios in order to articulate the rate of change over the forecast period. These are (for a full list please see appendix one):

LOW: Base program of work: only committed programs go ahead
MEDIUM: Increase of planned program of work: All committed programs + additional 20% of planned projects
HIGH: Super Boom: all committed programs go ahead + additional 60% of planned projects

Factor	Base Scenario LOW GROWTH	Increase in Planned Program of Work (+20%) MEDIUM GROWTH	Super Boom (+60%) HIGH GROWTH
World Economy	Remains at current level of stability	Moderate growth in BRIC Countries (Brazil, Russia, India, China) impacting demand for energy and investment	High growth in BRIC and Europe impacting demand for energy and investment
Fly In Fly Out (FIFO) Impacts	Numbers of workers on FIFO contracts remains stable	FIFO increases for both Qld and interstate workers due to the workforce numbers required to deliver programs of work. This is likely to impact both families and local communities	FIFO increases for both Qld and interstate workers due to the workforce numbers required to deliver programs of work. This is likely to impact both families and local communities
Carbon Tax	Carbon Tax introduced and deters investment in new major projects	Carbon Tax introduced with moderate impact of reduced commencements of planned major projects	Carbon Tax introduced with limited impact on commencement of planned major projects
Productivity of major projects	Reduced productivity deterring investment in new major projects	Moderate productivity gains found in work redesign, Industrial Relations climate and availability of skilled workforce	High productivity gains found in work redesign, Industrial Relations climate and availability of skilled workforce

Increase in Infrastructure Investment	Investment stays the same	Greater investment proposed for regional areas e.g. Gladstone	Greater investment proposed for regional areas e.g. Gladstone, as well as major electricity generation investment and large government works
Workforce Supply Impacts	Some increase in Apprenticeship numbers; Some increase in cross-skilling of existing workforce; Moderate use of 457 visas.	Large increase in Apprenticeship numbers; Some increase in cross-skilling of existing workforce; Moderate use of 457 visas.	Large increase in Apprenticeship numbers; Large increase in cross-skilling of existing workforce; Increased use of 457 visas.

Critical Workforce Skills

As part of the stakeholder questionnaires we asked what the perceived skill shortages will be for the next 5 years. This information was combined with survey outcomes from information gathered using the Electrical Contractors Association (ECA) and Electrical Trades Union (ETU) members to determine which skills sets were seen to have the highest need and the least availability. The following 6 job roles/skill sets were consistently identified:

1. Instrumentation, control and automation

Person competent in install, set up, test, fault find, repair and maintain systems and devices for measurement and recording of physical/chemical phenomenon and related process control. Defined as critical due to the shortfall in number of electricians required who have these skills and the inadequate numbers currently in training.

2. High voltage

High Voltage electrical workers - persons who require an understanding of or who are required to operate high voltage equipment. Defined as critical due to the shortfall in numbers of trained workers required to meet the demands of the resources boom.

3. Services and maintenance

Service and maintenance are required to program maintenance, condition monitoring, audits and planning. Defined as critical due to organizations unable to attract workers into this role due to wage pressures.

4. Vet trainers

Teacher of one or more subjects within a prescribed course of study at TAFE, or other training institute to tertiary students, for vocational education and training purposes. Defined as critical due to the shortfall in numbers and age profile of the current cohort of qualified VET trainers.

5. Hazardous location

Licensed electrical workers can gain specific skill-sets within the field of Electrical Equipment in Hazardous Areas (EEHA). EEHA is a unique environment and often a full qualification is not required. RTOs in this environment are often specialists in discrete areas of EEHA and do not offer full qualifications. Defined as critical due to the shortfall in numbers of trained workers required to meet the demands of the resources boom.

6. Lead hand/supervisor skills

The common directive of this job-role is to coordinate day-to-day production requirements. The Lead Hand will accomplish this through directing the work flow and communicating with the other supervisors and staff to deliver the products/projects on time. Lead Hands need to respond with the appropriate urgency and provide solutions; be responsible to ensure safe work practices are followed, and will train employees in this regard as well. Defined as critical due to the lack of formal development opportunities for workers at this level.

7. Estimators

Estimators are responsible for scoping projects and proving a cost analysis of time, equipment and resources, based on which quotes and tenders are made. Defined as critical due to the specialized nature of the role and the lack of formal development opportunities available.

These job roles are the focus for forecasting and strategy development initiatives for this project. However, ESQ also recommends some consideration be made regarding apprenticeship numbers with the aim of increasing the current number of apprentices in Queensland.

KEY WORKFORCE RISKS

The review of licensed electrical workers has identified a number of key risks to the electrical contracting industries which have the potential to impact the growth of QLD resources boom. We have projected on three scenarios of low, medium and high growth, and we believe the medium growth scenario to be the most likely to occur. Because of this, we have focused our risk assessment around those factors and believe the workforce risks to be driven by the increasing demand for licensed electricians.

Each risk is followed by a number of recommendations Energy Skills Queensland makes to JETCO for the development of its members. The key aims of the recommendations are to:

- Increase completion rates of electrical apprentices in training
- Increase numbers of apprentices entering training in the electrical field
- Increase the number of up skilling opportunities for licensed electricians to address the projected skills requirements

Risk One: Not enough electrical apprentices completing, in training or commencing

As shown in Figure 1, Queensland is going to see a shortfall of around 7,600 licensed electrical workers over the next 5 years. With only 8,000 apprentices currently in training, with the expectation that approximately only 5,000 will complete (electrical apprentice retention rate of 64%), in real terms only 1,500 apprentices are being trained each year. This number is taken into account when forecasting, and therefore indicates the sheer numbers of shortfall of future trained electrical workers. It is expected this shortfall will impact all licensed electrical trade roles.

Large mining and resources companies tend not to employ large numbers of apprentices in terms of electrician to apprentice ratios. There are many reasons cited for this, including safety concerns for immature and inexperienced workers operating on a mine site. However the greatest barrier is the lack of productivity of a first and second year apprentice when compared to the extra cost of travel, accommodation, supervision, etc, on a remote mine site.

Currently, there is a practice in the mining and resources sectors where larger organisations “poach” apprentices from smaller contractors in the third and fourth year of their apprenticeship. It is clear from the research that small/medium sized enterprises employ a higher percent of apprentices when viewed as a percentage of business size. This does not help the broader industry develop skills and has the potential to cause contraction of apprenticeship numbers as smaller contractors become increasingly disillusioned with employing and training apprentices. More must be done by larger organisations to increase apprenticeship numbers, especially in years 1 and 2 of the apprenticeship.

Cost of training apprentices has also been cited as a major barrier to employing more electrical apprentices. This is further exacerbated by smaller business not able to compete on wages with larger resource and mining organisations.

Risk Two: Risk of skills dilution due to the lack of on-the-job training opportunities

Concern has been raised by a number of stakeholders about the ability to gain on the job experience required for the critical job roles or skill sets outlined in Risk Three. In particular, Instrumentation Control and Automation and High Voltage require an on-the-job training component as part of the EE-Oz training package. On the job training can be difficult for individuals or contractors who wish to increase their skill sets or tender for new work but do not have the workplace opportunities to learn new skills.

Risk Three: Barriers to training opportunities

Of the seven critical job roles and skills sets identified as part of the project, each has its own barrier/s to training opportunities. These are outlined in the table below, and form the basis for a number of our industry and government action recommendations introduced in the next section.

Critical Skills	Barrier to training opportunities

Instrumentation Control and Automation	Lack of up-skilling initiatives currently being marketed to business.
High Voltage	Must be on the job training which makes it difficult for contractors who are trying to move into this area obtain experience. The lack of on the job experience in turn influences the ability to successfully tender for work.
Hazardous Areas	Currently there are a limited number of RTO's offering Hazardous Areas training in QLD as many of the larger proponents run this in-house e.g. Bechtel, John Holland, etc. Without additional investment in this particular skill set, it will be difficult for electrical contractors to successfully tender for work.
VET Trainers and RTO Capacity	Currently, salaries offered are not competitive with on-the-tools occupations. While there are several non-financial benefits such as increased paid leave, this job role is not seen as an attractive career path for practicing electricians. As well as the shortage of VET Trainers, there is also concern over the capacity RTO's have to increase numbers of apprentices being trained. This is driven by the limited number of RTO's offering the apprenticeship courses.
Services and Maintenance	Services and maintenance roles are one of the lowest paid sectors of the electrical industry. Because of this, retention and attraction into these roles have become increasingly difficult.
Lead hand/Supervisor Skills	Currently there is no training program suited to the electrical industry for the development of lead hand and supervisory skills. The training could include project costing, people management, project management, and risk assessment as an example.
Estimators	Currently there is a limited number of training courses suited to the electrical industry for the development of Estimators. There is an Estimators course for the building and construction industry which could be adapted for use in the electrical industry.

Risk Four: Lack of career path structure

Currently the career path structure of an electrician is defined by the grade types of the National Electrical, Electronic and Communications Contracting Award (2010) or individual Enterprise Bargaining Agreements. While ESQ is not suggesting this should be changed, further articulation is needed to define the different career path choices an electrician can have based on skill sets. This needs to start at career path structures for secondary school level and work through to Advanced Diploma and Degree level.

Risk Five: Ageing population creating knowledge loss from industry

It is well known in the industry that there is an ageing workforce of licensed electrical workers. More action is needed at industry and enterprise level to transition knowledge from 'individual' to 'institutional' power. This transition could be in the form of, for example, increased training numbers, improved mentoring and coaching schemes, or development of interactive industry case studies.

APPENDIX ONE: SCENARIOS FOR THE ELECTRICAL CONTRACTING INDUSTRY IN QLD 2012 - 2017

SCENARIOS 2012 - 2017

After extensive stakeholder engagement across the industry sectors, ESQ have identified three plausible scenarios for the period 2012 – 2017. These are:

- Base program of work: only committed programs go ahead
- Increase of planned program of work: All committed programs + additional 20% of planned projects
- Super Boom: all committed programs go ahead + additional 60% of planned projects

Factor	Base Scenario	Increase in Planned Program of Work (+20%)	Super Boom (+60%)
World Economy	Remains at current level of stability	Moderate growth in BRIC Countries (Brazil, Russia, India, China) impacting demand for energy and investment	High growth in BRIC and Europe impacting demand for energy and investment
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Increase in Infrastructure Investment	Investment stays the same	Greater investment proposed for regional areas e.g. Gladstone	Greater investment proposed for regional areas e.g. Gladstone, as well as major electricity generation investment and large government works

Workforce Supply Impacts	Some increase in Apprenticeship numbers; Some increase in cross-skilling of existing workforce; Moderate use of 457 visas.	Large increase in Apprenticeship numbers; Some increase in cross-skilling of existing workforce; Moderate use of 457 visas.	Large increase in Apprenticeship numbers; Large increase in cross-skilling of existing workforce; Increased use of 457 visas.

Why use scenario planning?

Scenarios focus on the joint effect of many factors and provide the most plausible views of the future of an industry or sector. They help to identify major events i.e. political, social, economic, technological, environmental, regulatory, that will shape what the future might look like and therefore help us to understand the impact the future will have on skills needs and development within our industry. It also helps us to anticipate any current weaknesses or inflexibilities that may need to be addressed.

SCENARIO ONE: BASE PROGRAM OF WORK (ONLY COMMITTED PROJECTS GO AHEAD):

Under this scenario, there is the expectation that all projects in Qld currently committed will go ahead as forecasted. There are no new additional major projects (greater than $300million each) approved over the forecast period (2012 – 2017). Key factors that influence this scenario are:

World Economy

The world economy remains stable enabling all current major projects to continue as planned

FIFO Impacts

FIFO impacts remain the same as they are currently. There are some social impacts on families coping with the strain of regular absences of one spouse. Local communities are not disrupted by a large transient workforce.

Carbon Tax

Carbon Tax introduced and deters investment in new major projects. The introduction of this tax under this scenario would see a halt to new investment in Qld in the short term.

Productivity of major projects

Reduced productivity decreases new investment in planned major projects. Productivity can be influenced by a number of factors, including:

- highly bureaucratic government processes
- industrial relations climate
- lack of innovation
- lack of skilled labour to perform key tasks

Increase in Infrastructure Investment

Investment in current infrastructure projects, including energy generation, remains stable.

Workforce supply impacts

There are some increases in apprenticeship numbers and training of existing electrical workers. Use of 457 visas remains low.

SCENARIO TWO: INCREASED PROGRAM OF WORK: BASE GROWTH OF PLANNED PROGRAM OF WORK DUE TO QLD RESOURCES BOOM (ALL COMMITTED PROJECTS + 20% OF THE PLANNED PROJECTS):

Under this scenario, there is the expectation that all projects in Qld currently committed will go ahead as forecasted, with an increase of 20% of additional projects currently being planned or under study (greater than $300million each). Key factors that influence this scenario are:

World Economy

Moderate growth in the BRIC nations (Brazil, Russia, India and China) impacting their demand for energy/resources, and therefore increasing investment in new major projects in QLD.

FIFO Impacts

More workers will be required to operate as FIFO because of the workforce numbers required to deliver programs of work. The social impacts of FIFO on families coping with the strain of regular absences of one spouse cause societal issues. Local communities are increasingly disrupted by a large transient workforce. A back-lash to this could eventually decrease the numbers of workers who are willing to work on FIFO basis, and therefore impact the ability to deliver projects on time/in budget.

Carbon Tax

Carbon Tax introduced with moderate impact of reduced commencements of planned major projects. The introduction of this tax under this scenario would see only a moderate impact on new investment in Qld in the short term.

Productivity of major projects

Moderate productivity gains found at industry and enterprise level. Productivity can be influenced by a number of factors, including:

- highly bureaucratic government processes
- industrial Relations climate
- lack of innovation
- lack of skilled labour to perform key tasks

Increase in Infrastructure Investment

Increased investment in current infrastructure projects in regional centre's e.g. Impacts of CSG expansion in Gladstone region and across the Surat Basin.

Workforce supply impacts

There is an increase in apprenticeship numbers and training of existing electrical workers. Use of 457 visas remains low.

SCENARIO THREE: SUPER BOOM (ALL COMMITTED PROJECTS + 60% OF THE PLANNED PROJECTS):

Under this scenario, there is the expectation that all projects in Qld currently committed will go ahead as forecasted, with an increase of 60% of additional projects currently being planned or under study (greater than $300million each). Key factors that influence this scenario are:

World Economy

High growth in the BRIC nations (Brazil, Russia, India and China) impacting their demand for energy/resources and therefore increases the investment in new major projects in QLD.

FIFO Impacts

Same impacts as scenario two.

Productivity of major projects

High productivity gains found at industry and enterprise level. Productivity can be influenced by a number of factors, including:

- highly bureaucratic government processes
- industrial Relations climate
- lack of innovation
- lack of skilled labour to perform key tasks

Increase in Infrastructure Investment

Increased investment in current infrastructure projects in regional centre's e.g. Impacts of CSG expansion in Gladstone region and across the Surat Basin. Increased investment in electricity generation projects as well as government infrastructure projects will also impact growth.

Workforce supply impacts

There is an increase in apprenticeship numbers and training of existing electrical workers. Use of 457 visas increases to fill gap between internal supply and workforce projections.

KEY ASSUMPTIONS ACROSS ALL SCENARIOS

Key assumptions that act as drivers for all scenarios are listed below. These drivers will play a role in the resources boom currently projected for Qld, and remain constant across all growth scenarios:

National Broadband Network (NBN)

Construction of the NBN alone will see an unprecedented demand for skilled workers including electrical lineworkers, telecommunications lineworkers, cable jointers, labourers and earthmoving plant operators. Providing a suitably-qualified and skilled workforce to construct it is critical to ensuring quality of the network, timely achievement of milestones and the effective mitigation of risk.

2018 Commonwealth Games

The 2018 Commonwealth Games will be located on the Gold Coast requiring upgrades of existing facilities, as well as building new domestic high-rise buildings. This is most likely to impact the domestic and commercial electrical contractors operating in the South-East region of Qld.

Ageing Population

Changing demographics and retention profiles' will increase the risk of knowledge loss in electrical industry, which will impact productivity and potentially increase workplace health and safety issues. The impact of an ageing population of the existing electrical contractors workforce; reduced numbers of middle career workers to fill experienced 'blue collar' and para-professional roles; and the increase of employee-initiated separations of younger workers, will all have significant impact on recruitment and retention strategies required to meet the need for electricians in QLD over the forecast period.

Occupational Health and Safety Harmonization

There are a number of changes in the Act that will impact QLD businesses and the way they currently operate with regards to Health and Safety. Smaller organisations will likely be most impacted by the harmonisation changes, but in particular by the change in liability between organisations and their subcontractors. The changes state that organisations now have health and safety obligations for any subcontractor working for them. This has meant smaller organisations must meet much more complex standards in order for them to win contracts e.g. speed limit machines in every work vehicle. Organisations that typically sub-contract their services will have to meet greater requirements to win work, which will have a cost impact that may form a barrier to smaller business. Larger organisations operating in the electrical contracting industry are likely to be least affected by the changes.

Electricity Demand

It can be assumed that electricity prices will continue to increase over the forecast period due to growing 'peak' demand loads. This will be further impacted in any scenario of growth, given each project will increase the energy demanded for those projects to be delivered. With the low numbers of electricity generation projects currently committed or planned, there is some concern that electricity supply will not be able to meet demand over the forecast period. It is expected this will only increase the need for skilled labour.

APPENDIX TWO: CONTRIBUTING STAKEHOLDERS

As part of the project, ESQ conducted several stakeholder interviews to determine the current and future environment for the electrical contracting industry in Queensland (see list below). ESQ also ran two surveys via the Electrical Trades Union and the Electrical Contractors Association. The information gathered in these surveys was also used to determine current and future skills needs for the industry.

1. Owen Blamires, Wondai Electrical Services
2. Stephen Boorer, John Holland
3. Rod Cruice, Electrical Safety Office
4. Mark Denning, Fallon Services
5. Tony Divertie, Ecolec
6. Damian Druery, Logan City Electrical
7. Robert Heskett, JETCO
8. Kirby Leeke, JETCO
9. Neil McBrearty, N&P Contracting
10. Keith McKenzie, Electrical Trades Union Qld
11. Peter Ong, Electrical Trades Union Qld
12. Glenn Porter, Energy Skills Queensland
13. Malcolm Richards, Electrical Contractors Association
14. Joe Richardson, J&P Richardson
15. Rob Scott, Pulse Electrical
16. Peter Simpson, Electrical Trades Union Qld
17. Greg Skyring, Conneq i.Power Solutions

APPENDIX THREE: FORECASTING METHODOLOGY

FORECASTING BASED ON HISTORIC DATA

Forecasting information based on existing historic information is mainly based on the assumption that trending of data in the past is an indication of trending of data in the future. For example, student enrolments have, over the past ten years increased by 10%, therefore it can be assumed that over the coming ten years enrolments will increase by another 10%. This assumes that, for example, external influences and policies will remain the same. The danger of forecasting inherent to this assumption is the fact that, from history, it is also known that the external environment will almost never be the same in the future. To compensate for this uncertainty of future states, forecasting is often delivered in 3 levels ranging from minimal to maximum and a medium state in between.

The forecasting model used in this report is not intrinsically different from what has been described above - trending of the past has been used to predict trending in the future – with the main adaption that trending has been examined on different time scales. How this has been incorporated in the forecasting methodology will be explained in detail below. In addition, through consultation with the client, only one forecasting figure will be reported, the medium state.

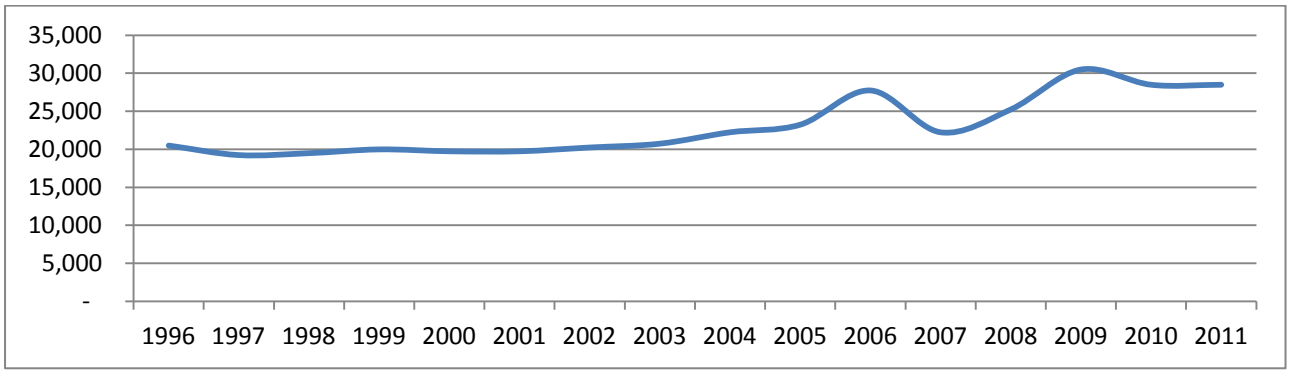

Figure 1: Historic data of a random job occupation

Figure 3 displays a randomly selected 15 year historic representation of a section of the Queensland labour force (source, ABS). For example, it can be seen that between 2007 and 2009 there was a significant increase in workers in Queensland in this category. It can also be seen that between 2010 and 2011 this number has remained the same. Forecasting based on a time series as represented above can be approached from a short term and long term perspective. In the short term, the trend of the last year indicates a 0% increase in the labour force. On the long term, the trend of the past ten years indicates a growth of 44% (or 3.7% per year). Obviously, both approaches have widely different results. The forecasting methodology used in this report follows an approach designed to negate the differences between the short and long term trending of data. When both numbers are used to predict the labour workforce in 2021, as shown in figure 4 (10yr in purple, 1yr in green), complete different results will follow, though both are based on an actual historic trend.

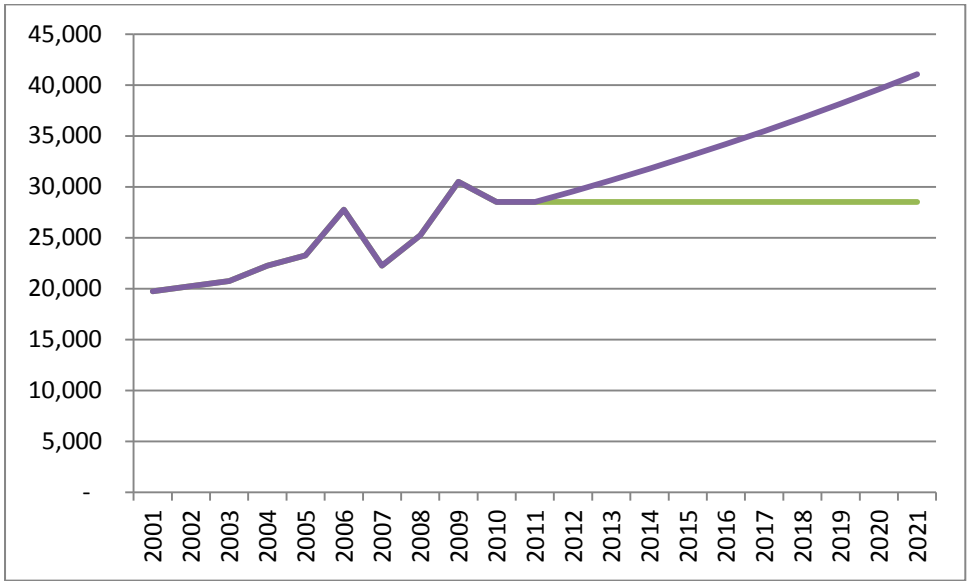

Figure 2: A random job occupation showing two trend lines based on short and long term trend

Additional to the assumption that historic trends can be a predictor for the future, it is further assumed that the time line examined to determine the trend, is also an indication to how far out this trend can be projected. In other words, a trend based on 1 year data, should only be used to forecast no-more than 1 year into the future. Similarly, a trend based on 10 years of data can be used to predict the future state 10 years in advance, but should not be used for 1 year in the future.

By extrapolating this line of thinking, a more nuanced perspective to the forecast can be determined, by using 1 year trending for 1 year forecasting, 2 year trending for the 2 year forecast, 3 year trending for the 3 year forecast, etc. A compounded approach to the forecast in this fashion is believed to represent a more nuanced forecast, within the limitations discussed of using trend data before, by better taking into account historic trends. Figure 5 shows the result of using the compounded trending data as a forecast predictor in blue.

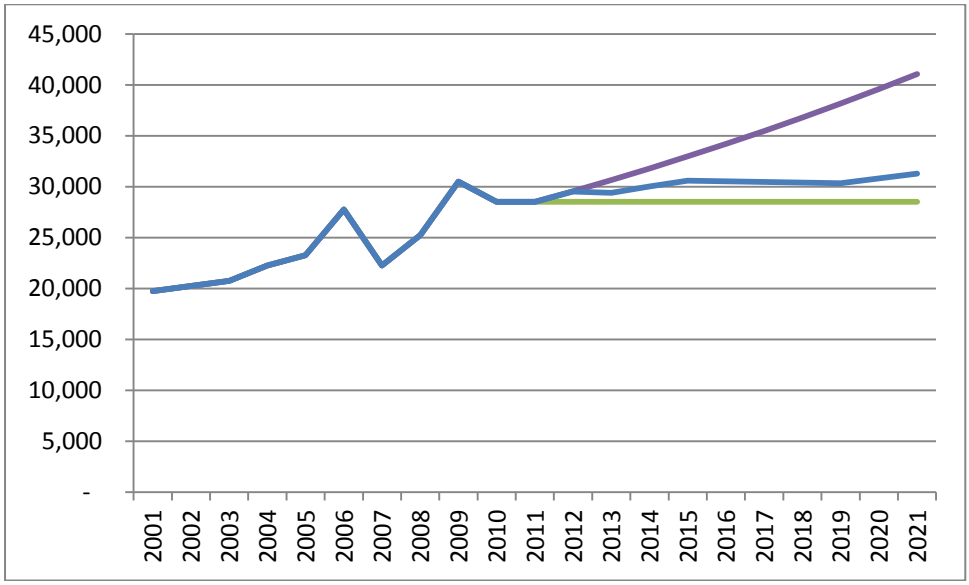

Figure 3: A random job occupation showing additional forecasting based on variable trending

Forecasting following this methodology has been used to forecast demand data (ABS labour force data) and supply data (supply of apprentices and engineers)

SUPPLY

Supply is a combination of two factors, retirement rates and education completion rates. The employment data (source: ABS) has been used as a baseline with retirement rates applied to this baseline. Organizational attrition rates have not been applied to the data as workers who leave a company but remain within the industry do not lead to a decline in supply. Industry attrition rates have been applied to account for the movement of workers leaving the industry. The number of students and apprentices completions have been added to the baseline to account for the influx of new workers.

All supply data has been obtained from two sources. The first source of data is for the supply of the apprentice related occupations. DET/DELTA has been used for the base education numbers of apprentices. Numbers used are completions at the end of each fiscal year. The second data source has been used for the supply of the engineering related occupations and is sourced from Engineers Australia. Engineers Australia records the completions of engineers. Unfortunately Engineers Australia has a long lag-time in presenting their data. Where no educational data was available, only retirement rates have been used to forecast the supply for these occupations.

DEMAND

Demand is a combination of demand as identified from a number of related sectors. These include, in no particular order; Electricity generation, CSG/LNG, the NBN, Renewable energy generation, Mining and Construction. Workforce planning documents for these sectors have been examined and the occupation demand overlapping with the electrical industry has been extracted. These demand numbers have been accumulated and added to the baseline data.

THE SKILLS GAP

By comparing the forecasted supply to the forecasted demand the projected skills gap is identified

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