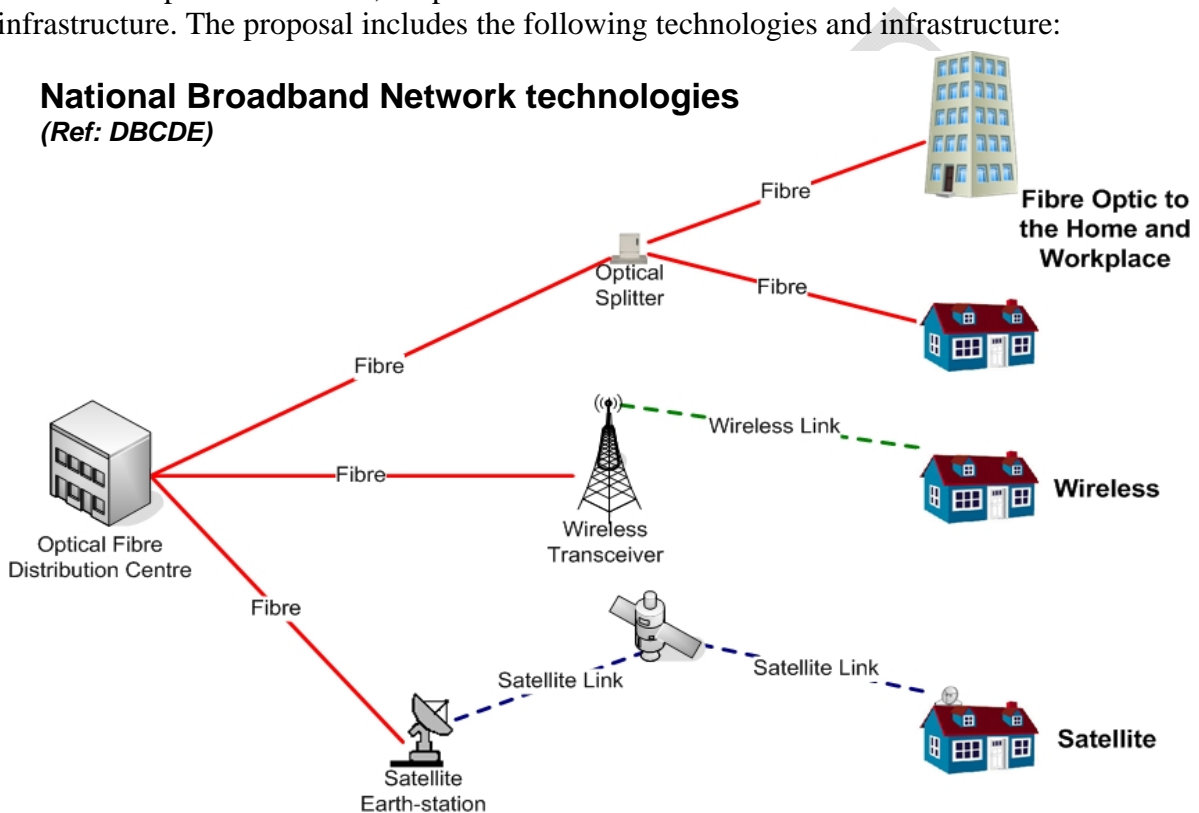


Summary of the Telecommunication Workforce Skills and Employment for the Broadband rollout

An overview of the Telecommunication Environment

The proposed Federal Government National Broadband Network (NBN) program will create a massive impact in the skills, shape and environment of the Australian Telecommunications infrastructure. The proposal includes the following technologies and infrastructure:

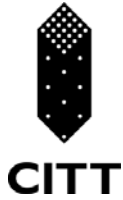
National Broadband Network technologies (Ref: DBCDE)



Impact of NBN on the Telecommunications Sectors

The NBN rollout will impact the industries in such areas as:

- Backhauling, telecommunications retail products and services, use of broadband as both as a domestic and business “tool”;
- The growth in broadband use in our schools is set to increase resulting growth in traffic growth is likely to place extra demands on school networks both wired and wireless;
- Community and national pressure towards efficient energy use through Smart power, water and Gas meters allowing energy monitoring through Broadband;
- Impact on current and “legacy” infrastructure such as copper, wireless, mobiles, etc.
- Effect on industry employment, workforce skills and training including short-term and future needs;



- Industry and Government support for a quality assurance model that provides recognition of programs, “skill sets”, monitoring/audits, professional development and encouragement of “new entrants” to the industry
- The increase in our aged population could see the broadband network used as a tool for monitoring the security and health of patients in their homes 24 hours per day through “E-health” policies and programs;

These are some examples of National Broadband Program impacting on communities, enterprises, industries and household consumers. Falling costs/prices and increased data rates will see a growth in the domestic use of broadband networks and an increase in the use of “packet based data” transport, such as Voice over IP (VoIP) will see the emerging of Data and Voice.

With broadband speeds the possible introduction of Internet Protocol Television IPTV could see the demise of Hybrid fibre Co-Axial (HFC) cable TV networks. [Thus where there were once two or three physical networks entering the home, they may eventually be only one.]

Impact of the NBN rollout on ICT Employment and Workforce skills:

The Telecommunications industry and the NBN partners and contractors will need to re-assess their workforce strategies to now include an additional variety of jobs, methods for engaging workers, employment opportunities and recruitment practices.

Historical employment practices of the Telecommunications industry

In the recent past, most telecommunications technical training was centred on the skill needs, technical standards and installation programs of the main telecommunications carrier(s), who was then providing end to end, universal service. Privatisation of most electrical, gas and transport statutory authorities, who also trained staff in telecommunications and related fields, has exacerbated the problems due to reduction in training and employment of apprentices and Trainees with Telecommunication skills. In the recent years the changing nature of employment and the high use of relatively short term contracts (say about 2 years) and short term planning due to contract lead in and phase down times has meant training has often not been a priority and this has impacted on current workforce skills required to perform these tasks effectively.

As the NBN rollout occurs and the demand increases for additional skilled workers the recruitment from an existing pool of staff, mainly ex-Telstra, Electricians, vendor companies staff and former statutory authority trained staff (such as rail, gas and electricity) may not be the solution available in both the short and long term. Some of the immediate recognised areas of difficulty (thus not being available for the NBN rollout) include:-

- ageing of the workforce leading to a shrinking of the pool of labour available for recruitment
- enterprises maintaining their workforce due to their skills needs
- loss of skilled staff to other work areas for a variety of reasons eg mining



- difficulties for regional areas in retaining skilled staff when contracts, salaries and conditions are usually better in the main city centres and
- often there are image problems with young people and potential new entrants not being attracted to the telecommunications technical and engineering career streams.

It should be stressed that current skill shortages issues that are affecting many technical and engineering areas within Australia are also common to other ICT sectors of the industry and not just the telecommunications sector. This has many implications on the current numbers available within the Telecommunications workforce and the need to dramatically boost the numbers and skills to meet the demands of the NBN rollout.

NBN and current employment opportunities

The NBN program will lead to high demand of workers in many existing and “new” employment functions. The current work force includes:

- With widespread contracting in place, a consequence is that currently there is a pool of approximately 5,000 technical staff that “moves” between the carriers, customer premises equipment and cabling providers, cable TV providers, data, alarm and other ICT services.
- **Currently:** 60,000 registered Cablers/DataComms, lifts and security personnel in Australia, with over 200 Licensed Carriers in Australia incl. Telstra and Optus (ref: A.C.M.A).
- **New:** Anecdotally an additional 10,000 Cablers/DataComms and Digital installers plus up-to 30,000 new positions in ICT sectors to meet the needs of the Digital and Broadband rollouts

The **increase** in numbers and job functions include:

Cabling/Data Comms.

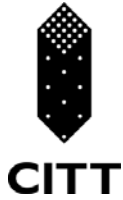
- Customer Access Network and Data Communication (optical, coaxial, copper)
- Consumer Premises Cabling
- Consumer Premises Equipment
- Electronics and Communications

Technician/Technologist

- Installation
- Commissioning
- Maintenance
- Technical Support

Engineering

- Network's (Telco & IT)
- Designers
- Infrastructure



Construction

- Rigging
- Backboning/Backhauling

Planner/Designer

- Computer Systems
- Networks
- Infrastructure

Customer and Technical Support

- Customer Support/Call Centre
- Customer Technical Help Desk
- Technician Technical Help Desk

Therefore the NBN workforce will require particular skills recognition, training and endorsements to meet the NBN program timelines and budgets.

Workforce Skills and Training Needs

These NBN programs will impact directly on the training and skills needed of the Technical and trade personnel. Under the current proposal for the rollout there appears to be many employment and workforce options for delivering the tasks and activities. For example in the Tasmanian “Trial” the partners are Aurora Electrical Company, NBN Tassie and the Tasmanian Government. This “trial” may use the Aurora infrastructure and assets and thus may have implications in who can actually undertake the work. This will be different on the Australian mainland where the infrastructure rollout may not use power-poles. This is a matter for the incumbents however the skills required to undertake the tasks remain the same irrespective of who does the Fibre rollout.

Current Competencies and Recognised Training Programs

The ICT02 (ver.3) Telecommunications and the UEE07 Electro-technology Training Packages currently includes the qualifications and competency skill sets that meet the needs of the Broadband (and Digital) rollout (*refer to the attachment for specific competencies and qualifications*).

Core Skill Needs, Skills Shortages and New skills for the NBN rollout

The experienced cabling including those under the A.C.M.A Cabling Provider Rules (CPR), which numbers around 60,000, may require (re) training or refresher skills training in the following areas:

- **OH&S.** Construction sites and new techniques.
- **Fibre Optics.** Basic principles eg splicing, applications and safety.
- **Coaxial Cable.** Basic applications and safety.



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- **Antennae/Satellite.** Basic applications, installation practices and safety.
- **Power Safety** - as power infrastructure is often used for telecommunications equipment mounting this is an area of growing need and “exchange fed power” to certain equipment types is also an issue of concern.

It is anticipated that about 25,000 new employees/contractors who will be required for the Broadband rollout in addition to the existing Telecommunications workforce. This includes cablers, network planners, engineers, riggers and other related skills within the Telecommunications industry.

Recognition and Training Demands on Skill Needs

Many skilled workers available in the labour market will require retraining and relevant skills upgrade through Professional Development, short courses and Recognition of Prior Learning (RPL)/ Current Competencies (RCC).

Existing Staff – Historically many existing technical staff are made up of ex-Telstra and other telecommunications, electrical/electrician, alarm, data cablers and related electrical/electronic industries, there is a need for some “re-training” and up-skilling to try and achieve reasonably core and common “Skill Sets” for enterprises involved in the broadband rollout, network repair and modernisation. This may be undertaken through the RPL/RCC processes, short courses and Professional Development.

There are many industry/enterprise and vendor specific programs available that are recognised by industry but may not meet the requirements of the AQF and the competency framework – these programs are vital to the skilling of this workforce in meeting product specific and warranty requirements and these programs may also be part of an “industry endorsement quality assurance” process along with the Competency Skill Sets and Qualifications.

Legacy Cabling

However as the NBN rollout occurs there is still work that needs to continue on existing infrastructure and legacy cabling. These cabling skills cannot be ignored as more people move into the new area of Fibre. Work on the maintenance of the current cabling infrastructure continues being a priority requirement for this infrastructure.

Government Funded Programs

The above core skill sets and Training Package qualifications may be funded through both Federal and State Government funded programs such as “Productivity Places Program” (PPP), RCC/RPL funding and the Traineeship and Cadetship programs which may result in providing these skill sets and/or qualification outcomes.

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Quality Assurance

In the current environment there are numerous industry base programs which may or may not meet the skill needs of the current and future workforce. Current Training Packages go somewhat towards meeting the recognition of programs and skills but the industry may need more urgent action. Even at the most basic level, the NBN applications will alter the work practices used by installers, technicians and engineers thus impacting on the workforce, their skills and how industry will undertake recognition of skills, industry training programs and Government funded qualifications.

These activities will require an industry approved model with Government support. The elements of this model may include monitoring, approved industry benchmarks and programs, industry/government approved qualifications, career pathways and professional development of the workforce to safeguard the consumer and the industry. The Telecommunications industry has already developed aspects of this “Quality Assurance” program and is being implemented within the Digital sector as part of the Digital rollout.

Issues and Activities Involved for Broadband Rollout

Role for the NBN Co. and Government Departments in regards to “Employment, Skills Training and Quality Assurance” is to provide consistent and national policy on the industry’s workforce planning, employment and to support the implementation of skills training and the required resources beyond the rhetoric.

National issues

The possibility of the concept of establishing a single body responsible of Skills and Training policies is a possibility as the National Training System already have existing Telecommunications Training Providers and various facilities throughout Australia that are delivering some vendor, enterprise specific, cabling training and ACMA/DEEWR competencies. However the opportunity exists with the establishment of the National NBN Co. for the industry to have a better (national) industry approach to skills training and career structure. This can be part of the NBN Co. agenda and explore the issues and obstacles confronting the industry including:

- Independent audit of current Telecommunications and Broadband Training Facilities and resources available to meet skill needs
- Encourage use of Apprentice/Traineeship programs for new entrants,
- Encourage Industry Productivity Places programs for RPL/RCC and up-skilling to gaps of existing cabling, and linking “up-take of new traineeships” to contracts
- National Coordination of VET in Schools programs (such as in Victoria) and identifying Schools to meet delivery requirements (e.g. Trade centers)



- Support for Industry QA processes in place and endorsed Resources and Materials including Industry Audits of work undertaken
- Relevant and accurate data on the Telecommunications industry and its sectors – currently all data under ICT and predominantly IT focused
- Support industry with Co-Regulation and workforce development and planning
- Industry to take responsibility for approved programs, resources, minimum competencies/skills and providing a “training fund” similar to Building industry
- Industry Audits of industry work, training programs delivered and industry resources available to meet these NBN skill needs

This one NBN body should be responsible for **all** aspects of Telecommunications/NBN workforce development, skills enhancement and training, resourcing on behalf of the industry.

Broad Issues and recommendations for consideration:

School Based Training – Co-operation between the Commonwealth and States is essential for this to be effective, and the training needs identified above can be included in existing school-based programs that are usually AQF certificate based. The success of this will provide the opportunity to roll this out across Australia on a State by State basis assuming that governments support and fund this program through Trade Centres and Schools.

New Entrants – New entrants may bring with them some basic computer or electronic skills, however, experience shows that it is common for a basic program which includes OH&S, basic electrical theory, basic telecommunications principles, hand and power tools and regulatory requirements is required. The fibre, Coaxial Cable, Antennae/Satellite and Power Safety programs are often required to round off capabilities. This may be addressed by the Apprenticeship, Traineeship and Cadetship programs.

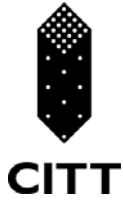
Migrants – Although some countries have well structured programs in place there are a number of migrants who need up-skilling and in particular training in Australian environmental, telecommunications, OH&S and other areas such as Australian legislation, regulations, training and skill standards. The “457 Visa” systems for short term alleviation of skills shortages may be growing, although accurate data on telecommunications is difficult to obtain.

Emerging technologies

There are new and emerging technologies occurring throughout the ICT industry however the impact on workforce skills is more about providing professional development and re-skilling to the existing workforce as well as new programs and qualifications.

Telecommunications Industry Image

The ICT industry, and in particular telecommunications, currently has image problems often as the result of extensive restructuring that has occurred over the past 10 years. Currently the ICT career emphasis is on Information Technology at the Higher Education level with very



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little emphasis on Telecommunications careers opportunities and skills. New entrants from school leavers need to be attracted to the industry.

Industry data on telecommunications - this is inaccurate for a number of reasons:

- There appears to be little detailed information relating to actual numbers of Telecommunications tradespersons, technicians and engineers and what statistical data is available on Telecommunications is not accurate as it is covered by the classification of ICT which covers both IT and T.
- Statistics generally look at the industry as a whole and rarely separate Technical and non technical personnel. The name commonly used in relation to employment in the industry is “Telecommunications service”. The issue here is that it does not give us a clear understanding of the size of the population that would potentially require (re)training.
- Currently, Telecommunications data used to make a number of policy decisions in departments is mainly assembled, initially at least, at state and territory level and is often buried in, say, services, electro-technology and trades categories, where there is no real relationship to the telecommunications industry.
- There is a trend, in the telecommunications industry, to out-source much of the on-site work. A very large portion of this out-sourced work is given to labour hire companies who in turn, pass it on to self employed trades-people and technicians. It is not clear, from the material we studied, whether these Telecommunications “Small Business Operators” are included in ABS statistics on the industry.
- The average age of the technical and trade force is increasing, as more and more of them choose to retire, (many well before age 65), a void will be created that can only be filled through apprenticeship technical training. The training industry needs to prepare for this expected surge in training demand. The training industry needs to tap the knowledge of these people before they retire so that their skills and knowledge is not lost.

Other issues that require consideration are:

- More enterprises employing young people using Australian Apprenticeships, Traineeships and Cadetships. Although the Cadetship system needs some development work as it has been neglected to a large extent, it is a useful, effective and practical alternative to higher education options in many circumstances.
- Addressing the “thin markets” problem in non-metropolitan areas through additional incentives to support training for telecommunications upgrade activities, such as the broadband roll-out in the remote and regional areas.
- Assisting enterprises to mentor and work closely with new entrant staff as part of the telecommunications up-skilling program.
- Providing additional support to identified, telecommunications “focussed” group training companies to better assist employers with apprenticeships, traineeships and cadetships (as per the RMIT experience above).
- Recognising the reality of the continuing problems with ageing of the workforce and loss of skilled staff to other work areas.

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- Ensuring broadband training is better integrated into existing telecommunications training programs and the training package system.
- RTO partnerships and Training infrastructure support – need to audit each RTO's capability in undertaking training at their location or if they need develop a partnership with other RTO/Enterprises in providing this support to train/retraining workforce

Some enterprises prefer staff to be multi-functional and on the payroll. Others only use sub-contractors. There is an ongoing need for national, structured training programs to be expanded to meet the needs of the industry and its individual sectors. Maintenance in rural areas and upgrades are a particular area of need and the recently there has been an increase in the use of the 457 visa system to top up the skilled staff pool. There is an urgent requirement to ensure the core infrastructure of the network can support the roll out of broadband and the new applications of technology that are being introduced for both amusement and business use.

Conclusion

The above outlines some of the employment opportunities, workforce issues, skills and processes required to meet the needs of the NBN rollout. It is imperative that a feasibility study on the Telecommunications Workforce development and planning be undertaken to detail the NBN needs and validate the above findings.

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ATTACHMENT

Summary of AQF Qualifications in ICT02 Telecommunications Training Package	
Code	Title
ICT20208	Certificate II in Telecommunications
ICT20308	Certificate II in Telecommunications Cabling
ICT20408	Certificate II in Telecommunications Access Network Cabling
ICT20508	Certificate II in Telecommunications Digital Reception Technology
ICT30208	Certificate III in Telecommunications
ICT30302	Certificate III in Telecommunications Cabling and Customer Premises Equipment
ICT30408	Certificate III in Telecommunications Access and Associated Services
ICT30508	Certificate III in Telecommunications Digital Reception Technology
ICT40208	Certificate IV in Telecommunications Engineering
ICT40302	Certificate IV in Telecommunications Computer Systems
ICT40408	Certificate IV in Telecommunications Network Planning
ICT40508	Certificate IV in Telecommunications Networks
ICT40608	Certificate IV in Telecommunications Computer Telephony Integration
ICT40708	Certificate IV in Telecommunications Radio Communications
ICT50202	Diploma of Telecommunications Engineering
ICT50302	Diploma of Telecommunications Computer Systems
ICT50508	Diploma of Telecommunications Networks
ICT60202	Advanced Diploma of Telecommunications Engineering
ICT60302	Advanced Diploma of Telecommunications Computer Systems
ICT60408	Advanced Diploma of Telecommunications Networks



List of ICT02 Telecommunications Skill Sets

Skill Set List

Skill sets are designed to be available to industry to train participants in a particular skill set that contains competencies that will be awarded with a Statement of Attainment and are able to be counted towards a qualification.

Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Cabler Registration Skill Set

Target Group	This skill set is for customer premises cablers working in the telecommunications industry.
Units	ICTTC136C Install, maintain and modify customer premises communications cabling: ACA Restricted Rule ICTTC137C Install, maintain and modify customer premises communications cabling: ACA Open Rule ICTTC170A Follow OHS and environmental policy and procedures
Pathway	This skill set provides credit towards ICT20208 Certificate II in Telecommunications.

Radio Technician Skill Set

Target Group	This skill set is for new entrants learning radio fundamentals. It can be applied to VET in Schools.
Units	ICTTC055D Install an antenna/wave guide ICTTC056D Install telecommunications network equipment ICTTC101D Locate and diagnose electronic faults ICTTC102D Repair communication system faults ICTTC170A Follow OHS and environmental policy and procedures
Pathway	This skill set provides credits towards ICT40708 Certificate IV in Telecommunications Radio Communications.

Access Network Skill Set

Target Group	This skill set is for carriers and contractors in the access network to perform core work on both sides of the network boundary.
Units	ICTTC008D Terminate metallic conductor cable ICTTC056D Install telecommunications network equipment



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	<p>ICTTC104D Maintain an electronic system</p> <p>ICTTC136C Install, maintain and modify customer premises communications cabling: ACA Restricted Rule</p> <p>ICTTC137C Install, maintain and modify customer premises communications cabling: ACA Open Rule</p> <p>ICTTC170A Follow OHS and environmental policy and procedures</p>
Pathway	This skill set provides credit towards ICT20208 Certificate II in Telecommunications and the ICT30208 Certificate III in Telecommunications.

Broadband Skill Set

Target Group	This skill set is for new entrants and experienced personnel in the telecommunications industry dealing with broadband implementation.
Units	<p>ICTTC013D Perform an accurate customer premises cable system test</p> <p>ICTTC055D Install an antenna/wave guide</p> <p>ICTTC065D Splice carrier/service provider optic fibre cable</p> <p>ICTTC131C Install an above ground equipment enclosure</p> <p>ICTTC153B Work safely near power infrastructure</p> <p>ICTTC170A Follow OHS and environmental policy and procedures</p>
Pathway	This skill set prepares individuals for entry to the telecommunications industry and provides credit towards the ICT20208 Certificate II in Telecommunications and the ICT30208 Certificate III in Telecommunications.

Telecommunications Networks Skill Set

Target Group	This skill set is for new entrants and experienced personnel in the installation of modern Telecommunications networks using converging technologies.
Units	<p>ICTTC170A Follow OH&S and Environmental Policy and Procedures</p> <p>ICTTC056D Install telecommunications network equipment</p> <p>ICAB4235B Build basic perimeter security into a network</p> <p>ICAB4240C Build an enterprise wireless network</p> <p>ICAI4097C Install and configure a network</p> <p>ICAI4188B Install and maintain a server</p> <p>IT prerequisite units</p> <p>ICAI3101B Install and manage network protocols</p>

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	<p>ICAS3120B configure and administer a network operating system</p> <p>ICAI4029C Install network hardware to a network</p>
Pathway	This provides credit towards a Certificate IV in Telecommunications Networks qualification.

Summary of AQF Qualifications in UEE07 Electro-technology Qualifications

UEE20707	Certificate II in Data and Voice Communications
UEE21207	Certificate II in Antennae Equipment
UEE21707	Certificate II in Technical Support
UEE21907	Certificate II in Electronics
UEE30407	Certificate III in Data and Voice Communications
UEE30807	Certificate III in Electro-technology Electrician
UEE30907	Certificate III in Electronics and Communications
UEE40207	Certificate IV in Electrical – Data and Voice Communications
UEE40607	Certificate IV in Electro-technology – Systems Electrician
UEE40707	Certificate IV in Electronics and Communications
UEE41707	Certificate IV in Rail – Communications and Network Systems
UEE60307	Advanced Diploma of Electronic – Technology
UEE60507	Advanced Diploma of Computer Systems – Technology
UEE61307	Advanced Diploma of Electrical – Technology

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