

# Australia's Relationship with ASEAN

Submission to the Joint Standing Committee on  
Foreign Affairs, Defence and Trade

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ENGINEERS  
AUSTRALIA

## Table of Contents

1.	Introduction	1
2.	Australian engineering links with ASEAN	1
3.	International mobility of engineers	2
4.	Mutual recognition agreements	3
5.	Supporting engineering MRAs within FTAs	6
6.	Climate change	7
	Appendix A: Profile of engineering exporters	9
	Figure 1: Priority countries for the removal of licensing barriers	3
	Table 1: International engineering agreements and ASEAN	4
	Box 1: Key international engineering agreements	5

## 1. Introduction

Engineers Australia is the peak body for engineering practitioners in Australia and represents all disciplines and branches of engineering, including information technology. Engineers Australia has over 80,000 members Australia wide and is the largest and most diverse engineering association in Australia. All members are bound by a common commitment to promote engineering and facilitate its practice for the common good.

The Joint Standing Committee on Foreign Affairs, Defence and Trade inquiry into Australia's relationship with ASEAN is welcomed by Engineers Australia. The discussion below considers the relationship of Engineers Australia with our ASEAN counterparts and outlines the international engineering agreements which are working to support the movement of engineers throughout the ASEAN region. An opportunity to support trade in engineering services within Free Trade Agreements is also discussed. Additionally, Appendix A provides a profile of the Australian engineering sector highlighting the international scope of the profession and its global links.

The impact of global warming on the region and opportunities to support Australia's relationship with ASEAN are also considered.

## 2. Australian engineering links with ASEAN

Engineers Australia has four overseas Chapters in Hong Kong, Malaysia, Singapore and the United Kingdom. Through the Chapters based in Asia, Engineers Australia has fostered relationships with engineering organisations within ASEAN including the Institution of Engineers in Singapore, Malaysia, Thailand and Indonesia and the Professional Engineering Boards in these countries.

Additionally, each year the Chief Executive and National President of Engineers Australia are invited to attend the Conference of the ASEAN Federation of Engineering Organisations (AFEO). AFEO is a nongovernmental body whose members are the national institution/organisations of engineers within each ASEAN country. AFEO has the following main objectives:

- to promote goodwill and mutual understanding, and
- to establish and develop standards for the engineering profession and to promote engineer mobility within ASEAN countries.

AFEO had its beginnings in 1973, from an inaugural engineering convention held between the Institution of Engineers Malaysia (IEM) and Institution of Engineers Singapore (IES). The Chairmanship and Secretariat of AFEO rotate among the ASEAN member nations along with the annual conference.

Engineers Australia is also involved in the Federation of Engineering Institutions of Asia and the Pacific (formerly known as The Federation of Engineering Institutions of Southeast Asia and the Pacific). FEIAP is a regional engineering network which was established in 1978 as an initiative of UNESCO. Engineers Australia has been a member of FEIAP since its inception. Current activities include work on university standards and qualifications, and work on environmental and sustainability issues to develop a sustainability policy position or charter acceptable to all member economies.

### 3. International mobility of engineers

Obtaining registration or a license to practice engineering in an overseas country can be a frustrating experience. In most countries, engineering is an “accredited” profession and as a result, engineers are required by law to be licensed before they provide professional services or use the title “professional engineer”. Many other accredited professions such as accountancy and legal services are also subject to accreditation or licensing requirements.

These licensing requirements can often operate as significant barriers to trade in professional services. This is because, in addition to having professional qualifications, licensing requirements contain other conditions such as completing practical training, passing examinations and meeting language, good character and reputation, citizenship or residency conditions.

The removal of these hurdles will rely on increasing the international recognition of qualifications and professional experience and the negotiation of mutual recognition agreements. These developments are an important means for professional service providers to gain international market access. The extent to which recognition of qualifications is a problem is likely to vary by sector and by country.

Given the different regulatory environments operating for engineering professionals internationally, the most important issue for Australian engineering service providers becomes the clarity of local regulations and licensing requirements operated by foreign governments. Instability and inconsistent application of regulation increases difficulties for companies operating in markets with which they are relatively unfamiliar.

A survey undertaken by Engineers Australia on trade issues has indicated that many engineering professionals have been discouraged from pursuing projects in countries (including within ASEAN) where regulations are unclear or ambiguous.

Currently, around 27 percent of companies deliberately avoid undertaking work in areas where they would need to try and obtain ‘in country’ registration for their staff and/or directors. In some cases, Australian engineering companies are deciding not to pursue overseas opportunities because of the difficulties of gaining registration in overseas countries.

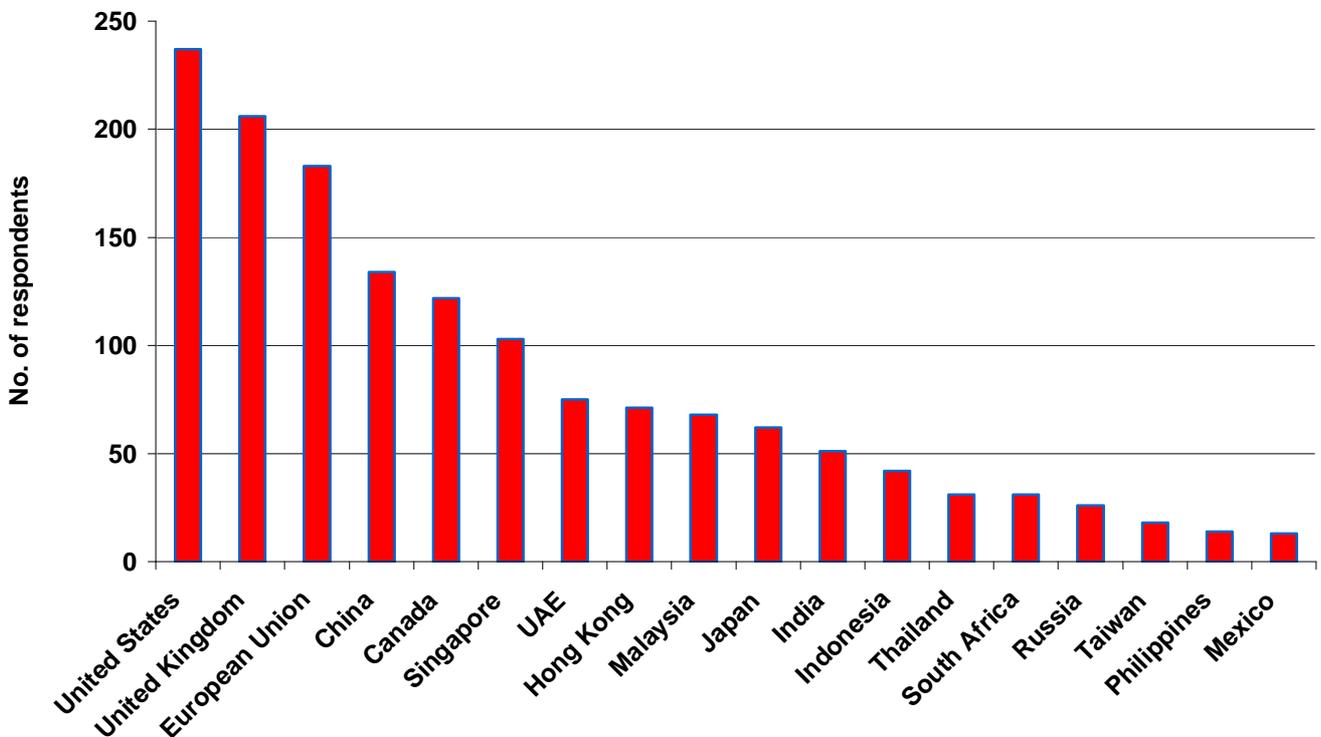
In particular one company responded with the comment, “For a small company like mine doing business overseas has often appeared too hard, hence the priority has been to focus on local business.”

Additionally, almost every economy in the world was identified by at least one respondent as a priority for streamlining licensing processes. The US ranked highly, as did the European Union, China, Canada and Singapore and other ASEAN countries including Malaysia and Indonesia who also have complex licensing procedures (Figure 1).

The survey also queried whether individual engineers had managed to gain a license in a foreign jurisdiction. Out of 1006 respondents, only 197 engineers had managed to gain registration in a foreign country.

Common to all discussions about undertaking engineering work in a foreign jurisdiction is the need to obtain registration or a license to practice engineering in an overseas country. All stories are coloured with frustration. This barrier coupled with restrictions on the temporary migration of labour dramatically impedes trade in engineering internationally.

Figure 1: Priority countries for the removal of licensing barriers



## 4. Mutual recognition agreements

A number of mutual recognition agreements (MRAs), or attempts at moving toward international standards for a given profession, have been initiated and undertaken by industry itself, with little or no involvement by governments.

For engineering, accredited Australian qualifications and overseas engineering qualifications are recognised through formal MRAs with engineering accreditation bodies in other countries.

Engineers Australia has invested a large amount of time and energy in developing and facilitating trade in engineering services at a multilateral level through the APEC Engineer Register, the International Professional Engineers Register, the Washington Accord and other international engineering organisations. Those of interest to Australia's relationship with ASEAN are outlined in Table 1.

Engineers Australia is hopeful that existing engineering agreements such as the Washington Accord will be supported by the Australian government, particularly within free trade agreements. Mechanisms to support ongoing work on trade in professional services within/beyond FTAs should also be seriously considered.

There are opportunities for Australia's relationship with ASEAN to be strengthened through the negotiation of mutual recognition agreements for professional service providers including engineers.

**Table 1: International engineering agreements and ASEAN**

Country	Engineering Agreement	Signatory
Indonesia	APEC Engineer Register	Institution of Engineers Indonesia
Malaysia	Washington Accord (provisional member) Engineers Mobility Forum APEC Engineer Register	Board of Engineers Malaysia Institution of Engineers Malaysia Board of Engineers Malaysia
Philippines	APEC Engineer Register	Professional Regulatory Board
Singapore	Washington Accord Engineers Mobility Forum APEC Engineer Register	Institution of Engineers Singapore Institution of Engineers Singapore Institution of Engineers Singapore
Thailand	APEC Engineer Register	Council of Engineers Thailand
Australia	Washington Accord Sydney Accord Engineers Mobility Forum APEC Engineer Register	Engineers Australia
Vietnam, Brunei Darussalam, Cambodia, LaoPDR and Myanmar are not party to any of these agreements.		

In particular, mechanisms to support the negotiation of MRAs for licensing and registration must be made a higher priority. The recent MRA between Engineers Australia and Engineers Canada and the imminent MRA signing with the Texas Board of Professional Engineers (TBPE) could potentially be used as templates.

Engineers Australia has recently signed a MRA with Engineers Canada. This MRA was negotiated independently of any existing international engineering agreements and provides for Australian Chartered engineers or those on the National Professional Engineers Register (NPER) to practice in Canada. In return, Canadian licensed engineers are eligible for membership of Engineers Australia at the Chartered level and for placement on NPER.

Engineers Australia will also sign an MRA with the Texas Board of Professional Engineers (TBPR) on 24 September 2008. Mirroring the Canada MRA the agreement with the TBPE was negotiated independently of any existing international engineering agreements and provides for Australian Chartered engineers or those on the National Professional Engineers Register (NPER) to gain a temporary renewable three year license to practice in Texas. In return, TBPE licensed engineers are eligible for membership of Engineers Australia at the Chartered level and for placement on NPER.

The MRA negotiations with the TBPE were supported by the Department of Foreign Affairs and Trade under the Australia – United States Free Trade Agreement Professional Services Working Group.

### Box 1: Key International Engineering Agreements

#### ***Washington Accord***

The Accord was signed in 1989 and was the first international engineering agreement. The signatories have exchanged information on, and have examined, their respective processes, policies and procedures for granting accreditation to engineering academic programs, and have concluded that these are comparable or “substantially equivalent”.

The signatories also agree that graduates of programs accredited by any of the signatory bodies should be recognised as having met the academic requirements for entry to the practice of engineering. In particular provision 2 of the Accord states that:

*“each signatory will make every reasonable effort to ensure that the bodies responsible for registering or licensing professional engineers to practice in its country or territory accept the substantial equivalence of engineering academic programs accredited by the signatories to this agreement.”*

Often the signatory to the Accord is the Institution of Engineers rather than the licensing/ registration body, which is often a government appointed Board of Engineers. As a result it is not assured that Washington Accord accredited degrees will be recognised by the licensing Boards in member countries.

For example, the Professional Engineers Board in Singapore does not currently recognise all Australian engineering degrees despite the Washington Accord. There is scope for the Australian government to work to encourage the PEB in Singapore to recognise the Washington Accord.

#### ***APEC Engineer Register and Engineers Mobility Forum***

The concept of these agreements is that a person recognised in one country as reaching the agreed international standard of competence (licensed or registered) should only be minimally assessed (primarily for local knowledge) prior to obtaining registration in another country that is party to the agreement.

The oldest such agreement is the APEC Engineer Register which commenced in 1999. The representative organisation in each economy creates a "register" of those engineers wishing to be recognised as meeting the generic international standard. In theory, other economies should give credit when such an engineer seeks to have his or her competence recognised. However, the agreement is currently not facilitating free movement of engineers within member economies. As such, there have been attempts to sign bi-lateral mutual recognition agreements (MRAs) under the APEC Engineer Framework to facilitate this. Australia has a limited MRA with Japan using this model.

The Engineers Mobility Forum agreement on an International Register of Professional Engineers commenced in 2001. It operates in the same way as the APEC Engineer agreement but any country/economy may join. The parties to the agreement are largely engineering bodies. There are intentions to draw the EMF and APEC Registers closer together.

Detailed information on each agreement can be accessed at [www.washingtonaccord.org](http://www.washingtonaccord.org)

### 5. Supporting engineering MRAs within FTAs

The development of MRAs for professional services can be facilitated through FTA negotiations and the Australia – United States Free Trade Agreement Professional Services Working Group is one mechanism. Engineers Australia's preference would be for the FTA to support existing engineering agreements such as the Washington Accord. For example, with both governments agreeing that the Washington Accord and/or APEC Engineer Register will be used by their licensing/registration Boards.

While the Singapore-Australia FTA (SAFTA) had provisions to encourage professional bodies and licensing/registration Boards to negotiate MRAs (but not a Working Group) no MRA negotiations have been facilitated between Engineers Australia and the Professional Engineers Board in Singapore under the FTA.

The ASEAN – Australia – New Zealand FTA seems set to mirror the provisions of SAFTA. However Engineers Australia appreciates the difficulties in negotiating a plurilateral agreement and is more concerned about the inclusion of mutual recognition provisions within bi-lateral FTAs. The Malaysia- Australia FTA negotiations are therefore an important upcoming opportunity.

Additionally, AFEO has embarked on a mission to spearhead the mobility of engineers within ASEAN with the formation of the ASEAN Engineers Register. This is in line with the ASEAN Secretarial program for the liberalisation of professional services within ASEAN.

Engineers Australia believes that the Australian government needs to support initiatives to promote the international mobility of Australian engineers wherever possible. As Appendix A shows, Australian engineers and engineering firms are highly mobile and are providing expertise to an international marketplace. In this global environment, the engineering profession has been very proactive in attempting to remove barriers to the international movement of the profession.

The Australian government now needs to build on this level of engagement and support existing international agreements within FTAs as well as the negotiation of new MRAs. As the ASEAN Register of Engineers develops this will become increasingly important. It would be extremely disappointing if the ASEAN register developed to a level where full mobility and portability of engineering education and expertise was reached within the region while the Washington Accord and APEC Engineer Register continued to be ignored within government trade initiatives.

The work of engineering professional associations towards international mutual recognition of university qualifications and licensing/registration needs to be supported by the Australian government wherever possible in FTAs under review (Singapore-Australia FTA) and future FTAs (Australia-Malaysia FTA).

Engineers Australia recommends that:

- The Australian government should ensure that any FTAs they negotiate include a workable MRA on the domestic regulation of engineering services.
- There is a need to review the work done by Engineers Australia in negotiating MRAs and wherever possible, these agreements should be included and supported within future FTAs.

### 6. Climate Change

There is widespread agreement that unless there is an international agreement to reduce and limit greenhouse emissions, serious global climate changes are highly likely in coming decades.

Possible climate change impacts in South East Asia were extensively canvassed by the International Panel on Climate Change (IPCC) in its Fourth Assessment Report<sup>1</sup>. In summary, key impacts include:

- There have already been observations that crop yields in many countries have fallen due to rising temperatures and increased climate variability.
- Climate variability is expected to increase escalating the risks of hunger and water resource scarcity.
- Projected sea-level rises are likely to result in significant loss of coastal eco-systems and large numbers of people will be displaced because of coastal flooding.
- There is likely to be increases in adverse impacts on human health with diarrhoeal diseases and the abundance and toxicity of cholera given particular mention.
- Climate change is expected to impinge on sustainable development by compounding pressures on natural resources and the environment from rapid urbanisation.

The Draft Garnaut Report<sup>2</sup> noted that in 2005, ASEAN countries collectively emitted 4.8% of global greenhouse gas emissions compared to 1.5% by Australia. While these emissions may appear small compared to emissions from China, the USA and the EU, Australia has a vital interest in convincing ASEAN countries that greenhouse gas reduction is essential to their futures and that active ASEAN participation in securing an international agreement on climate change mitigation is essential.

On the 14 March 2008, the European Council of the European Union considered a report prepared by the High Representative and the European Commission on climate change and international security<sup>3</sup>. This report noted that all but one appeal to the United Nations for emergency humanitarian assistance in 2007 was climate related.

The arguments raised in the Report covered similar ground to an earlier Report by the Lowy Institute<sup>4</sup> which had a more specific Asian focus. These analyses agreed that climate change will impact as a threat multiplier exacerbating existing trends, tensions and instability in States overburdened with development pressures, which are sometimes fragile and conflict prone<sup>5</sup>.

The threats identified include:

- Conflict over resources as available arable land is reduced and water scarcity increases.

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<sup>1</sup> International Panel on Climate Change, Fourth Assessment Report, Working Group 11, Impacts, Adaptation and Vulnerability, Chapter 10, Asia, [www.ipcc.ch](http://www.ipcc.ch)

<sup>2</sup> Draft Garnaut Climate Change Review, June 2008, p99, [www.garnautreview.org.au](http://www.garnautreview.org.au)

<sup>3</sup> European Commission, Climate Change and International Security, [www.consilium.europa.eu](http://www.consilium.europa.eu)

<sup>4</sup> Alan Dupont and Graeme Pearman, Heating Up the Planet: Climate Change and Security, 13 June 2006, [www.lowyinstitute.org](http://www.lowyinstitute.org)

<sup>5</sup> European Commission, op cit, p2

- Economic damage and risk to coastal cities and critical infrastructure. This was highlighted in the IPCC Report.
- Loss of territory and border disputes as rising sea levels inundate coastlines and small island states.
- Environmentally induced migration within and between countries.
- Climate change may increase instability in weak and failing states by exacerbating already limited capacity of governments to respond to challenges they face.
- Tensions over energy supply as much of the world's hydrocarbon reserves are in regions vulnerable to the impacts of climate change.

Australia already has a range of climate change initiatives in place in the ASEAN area and surrounding countries including:

- The International Forest Carbon Initiative;
- Methane to Market Partnership;
- Renewable Energy and Energy Efficiency Partnership; and
- Carbon Sequestration Leadership Forum

These initiatives are typically small cooperative activities which draw on Australian expertise to improve knowledge and capacity in other countries. In some cases there are direct arrangements with particular ASEAN partners, for example some of the cooperative activities with Indonesia under the International Forest Carbon Initiative<sup>6</sup>.

Engineers Australia believes that there is considerable scope for Australia to expand these activities both in scale and in the coverage of countries. Rapid accumulation of knowledge relating to carbon accounting, how it is applied to different countries carbon challenges and how it relates to active participation in a comprehensive international emissions reduction agreement are vital to Australia's interests.

Engineers Australia believes that energy efficiency measures and technologies offer particular potential for international collaboration. Low energy efficiency is widely recognised as a major contributor to excess energy use and to energy related emissions in developed countries. Assisting ASEAN countries in becoming more energy efficient will enable them to by-pass the mistakes made in other countries while assisting them to meet development aspirations.

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<sup>6</sup> Australian Government, International Forest Carbon Initiative, [www.climatechange.gov.au](http://www.climatechange.gov.au)

## Appendix A - Profile of Engineering Exporters

In most official statistics, engineering services are absorbed in the broader categories of business services, other services or construction activity. However, the engineering sector is a diverse and large profession that includes a range of practitioners, such as professional engineers, engineering technologists, engineering associates, and tradespeople.

Engineering is about applying science and technology to develop and implement new technologies, placing engineers in a central role in improving the security and living standards of the community, improving the standards of environmental care and generating wealth for Australia.

The traditional focus of engineering activities has been in infrastructure – the fundamental facilities and systems that allow a modern society to function effectively. These include transportation, communication systems, energy and water supply, and waste removal. However, engineering impacts on many aspects of community life. For instance, the following lists only some of the areas in which professional engineers commonly practice:

Acoustics	Electronics	Naval architecture
Aeronautics	Engineering education	Nuclear
Agriculture	Engineering survey	Petroleum and gas
Arbitration	Environment	Pipelines
Automation and control	Fire safety	Process control
Biomedical	Food technology	Public health
Bridges and viaducts	Foundations and footings	Quality management
Building services	Fuels and energy	Railways
Building surveying	Geotechnics	Risk
Civil	Industrial	Roads and highways
Chemical	Local government	Software
Coastal and oceans	Maintenance	Space
Communications	Manufacturing	Structural
Computing	Materials	Telecommunications
Construction management	Metallurgy	Transportation
Dams	Military	Water resources
Electric power	Mining and tunnelling	

The most commonly traded engineering services are consultancy services typically consisting of design services, planning and design development, procurement services, field services during construction and project management. These services usually fall within three broad categories. For example:

- **General services:** Feasibility studies, cost estimations, preparation of drawings, specifications and contract documents and the supervision of construction;
- **Specialised services:** Design and development of process equipment, environmental advisory and design services, materials testing, software or systems development and project management; and
- **Comprehensive services:** Turnkey services such as build-own-operate-transfer contracts.

With advanced communication systems many of these services can and are being supplied "cross border". For example consulting can be performed on-line, with designs, specification, blueprints and know-how being transmitted electronically.

Despite the increased ease with which engineering services can be provided electronically, it seems that while the cross border supply of engineering services is increasing, the bulk of services are continuing to take place through commercial presence or the movement of engineers overseas.

The Australian engineering industry is becoming increasingly competitive at the international level and the ability of Australian companies to provide engineering services to overseas countries has increased throughout the last decade.

In 2006, Engineers Australia surveyed members to discuss the nature of global engineering and to build a profile of Australian engineering exporters. Two surveys were undertaken, one for individuals and one covering the activities of companies.

Information was gained on the type, size, cost and length of projects being undertaken overseas, the international movements of members including what countries they work in and for what time periods, what barriers to trade they encounter and information on the internationalisation and outsourcing of engineering design services.

The aim has been to try and capture some of the non-tariff barriers operating to restrict trade in engineering services, particularly domestic regulations and licensing procedures that may impose restrictions on trade in engineering services in various countries. Analysis of the survey results has been used to build the following profile of engineering exporters.

### ***Company type***

Australian engineering companies with Australian offices only (34 percent of survey respondents) and Australian engineering companies with offices in both Australia and in overseas countries (35 percent) are involved in offering their services overseas at similar levels. Nineteen percent of respondents were also foreign companies with offices in Australia highlighting that Australia is both an importer and exporter of engineering expertise. Companies falling into the 'other' category made up 12 percent of respondents.

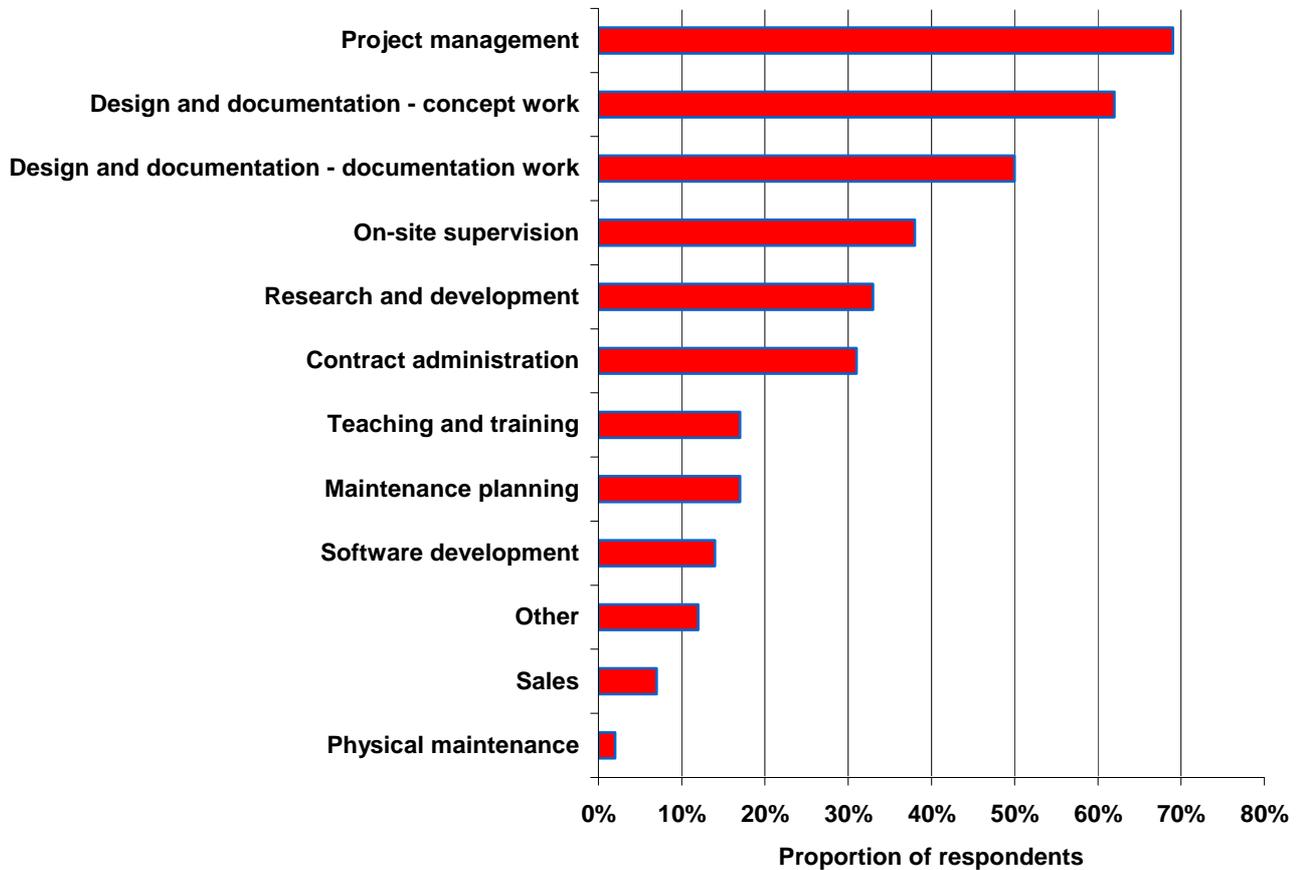
### **Number of employees**

Regardless of company size, all survey respondents had staff located both in Australia and internationally including small companies of up to four employees' to larger companies with over 1000 employees. Thirty six percent of companies who responded to the survey had 1000 or more employees in overseas offices. Twenty seven percent of companies also had 1000 or more employees located in Australia. On the whole, companies with the largest number of employees were much more likely to be involved in international activities.

### **Type of work**

Companies with international operations are rarely involved in just one area of engineering work. However the survey results clearly show that many companies (over 60 percent) spend a significant proportion of their time undertaking project management and design and documentation work as outlined in Figure A.1.

Figure A.1: Type of work undertaken



Around 17 percent of companies are involved in teaching and training, which is a technology transfer from Australia to the host economy. It can also be assumed that a significant amount of informal technology transfer is taking place on top of this 17 percent, in both directions.

Companies who selected the 'other' category indicated they were also involved in:

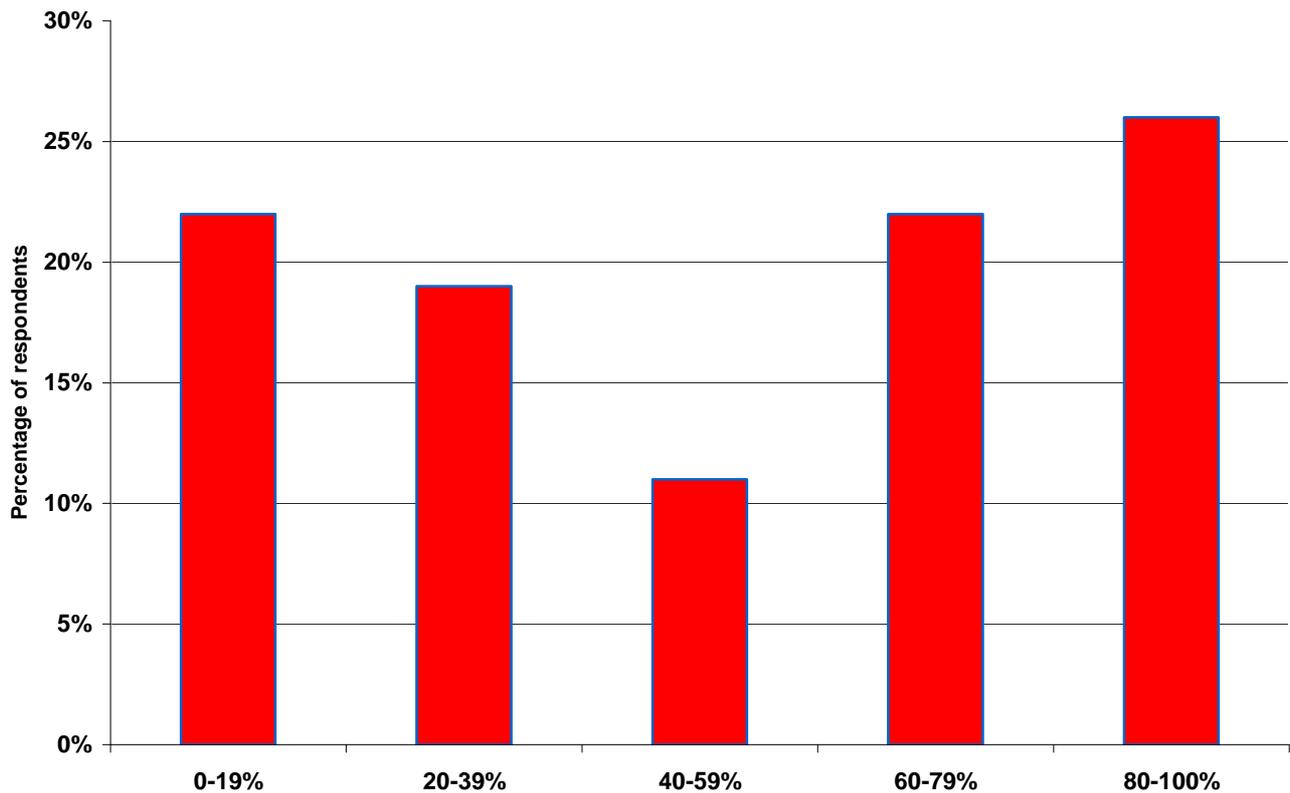
- Site work regarding conveyor belt condition;
- Systems development for civil aviation communications testing;
- Risk management;
- Estimating, tendering and contract valuations; and
- Assessment and assistance to laboratories and certifying bodies

### Percentage and value of projects undertaken in Australia and overseas

The percentage of work done by companies for projects both overseas and in Australia identifies some interesting trends. Over 30 percent of respondents indicated that five to 20 percent of their companies' projects were based overseas. At a similar rate, almost 30 percent of companies also identified that 80 to 100 percent of their work was for Australian projects.

While this may seem confusing, it actually identifies that companies tend to have two distinct approaches to working overseas. One type of company undertakes 80 to 100 percent of its work in Australia and the rest of its work overseas (5-20 percent), while the majority of other companies undertake 80 to 100 percent of their work overseas and the rest of their work in Australia (5 to 20 percent). The value of the international work to companies also reflects this breakdown as shown in Figure A.2.

**Figure A.2: Overseas work as a proportion of revenue in a financial year**

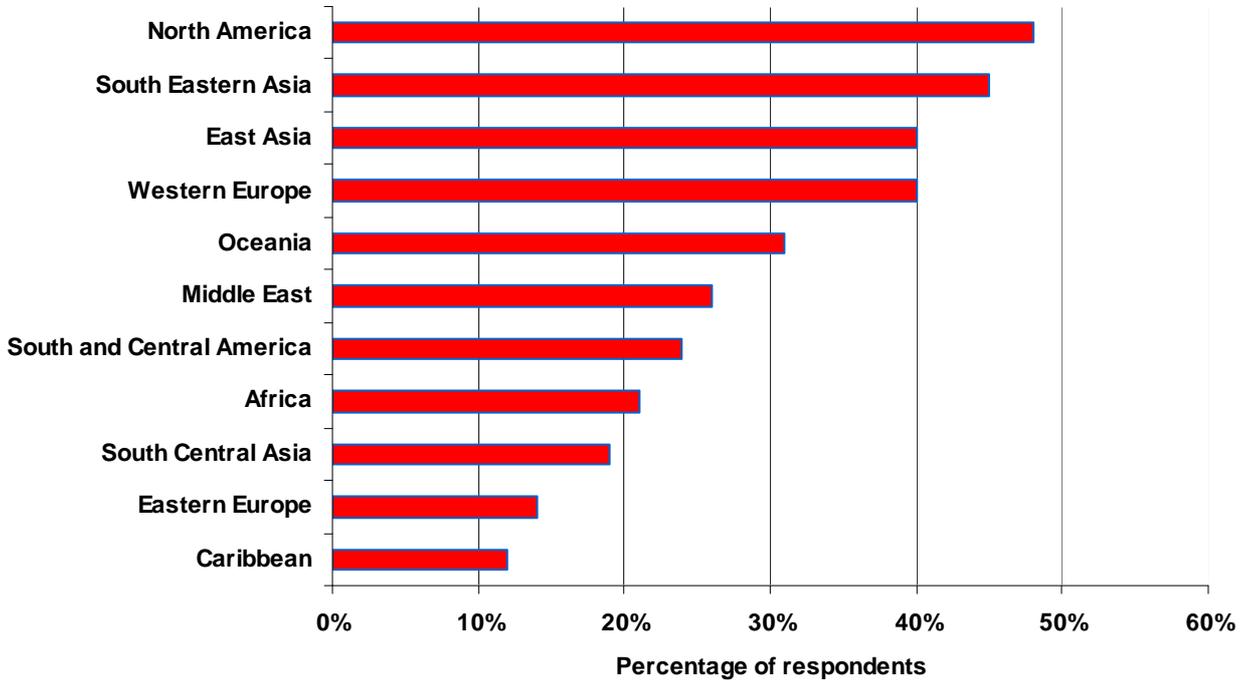


### **Regions where clients outside Australia are based**

The survey results also confirmed that Australian engineering companies are undertaking work across the globe. While over 40 percent of companies who responded to the survey undertake work in North America and South East Asia, engineering services work is also being undertaken at significant levels in all regions. A high level of engineering work is being undertaken not only in Asia Pacific Economic Cooperation (APEC) countries but also in Western Europe, the Middle East and Central America.

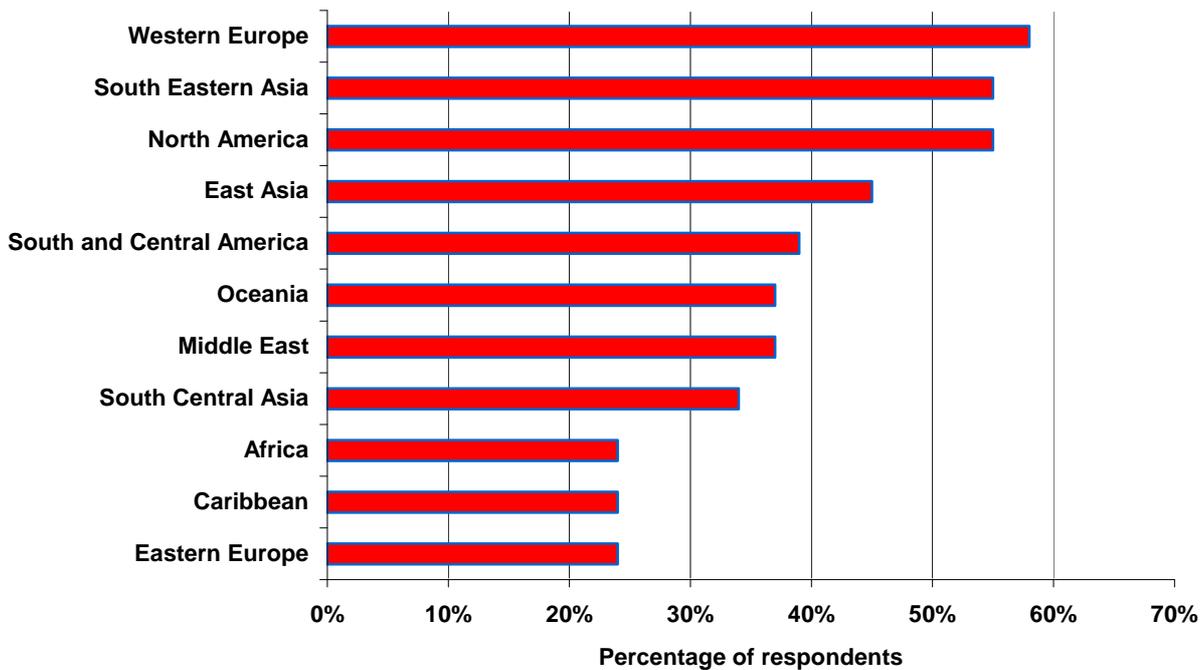
Forty eight percent of companies that responded to the survey had clients predominately based in North America. Forty five percent had clients in South Eastern Asia while 40 percent had their major clients based in Western Europe or East Asia. Eastern Europe and the Caribbean were also represented with 14 and 12 percent of engineering companies having clients based in these regions as represented in Figure A.3.

**Figure A.3: Region's where clients of companies are based**



As Figure A.4 outlines, over 50 percent of companies who responded to the survey had set up offices in North America, South East Asia and Western Europe to service the needs of these international clients<sup>7</sup>.

**Figure A.4: Regions where companies have overseas offices**

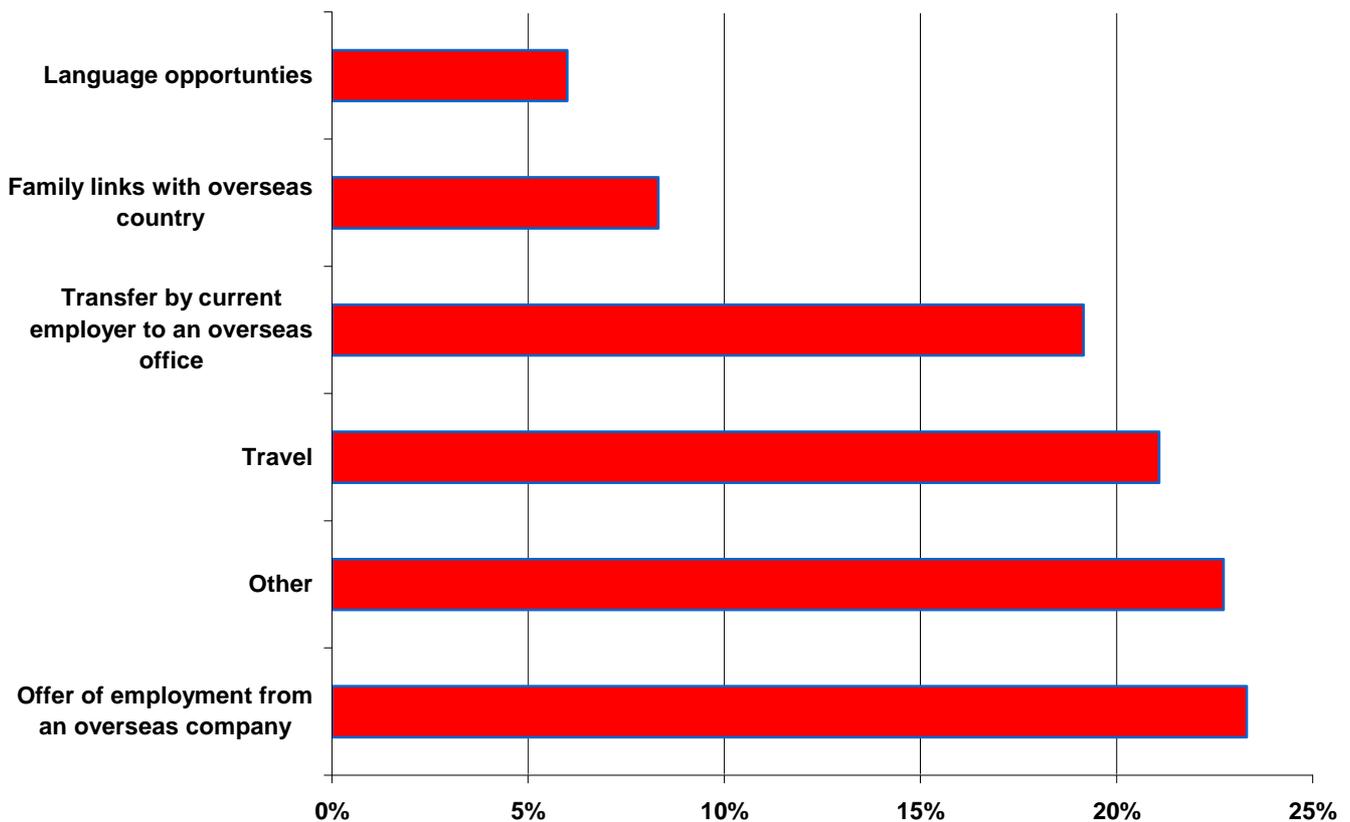


<sup>7</sup> Each company has more than one overseas office. As a result the figures do not add to 100%

## International movement of Australian engineers

A number of questions about temporary migration were asked to both companies and individual engineers in the Engineers Australia survey. Individual engineers were motivated by employment and language opportunities, travel and family links to leave Australia as outlined in Figure A.5.

**Figure A.5: Motivation for leaving Australia**

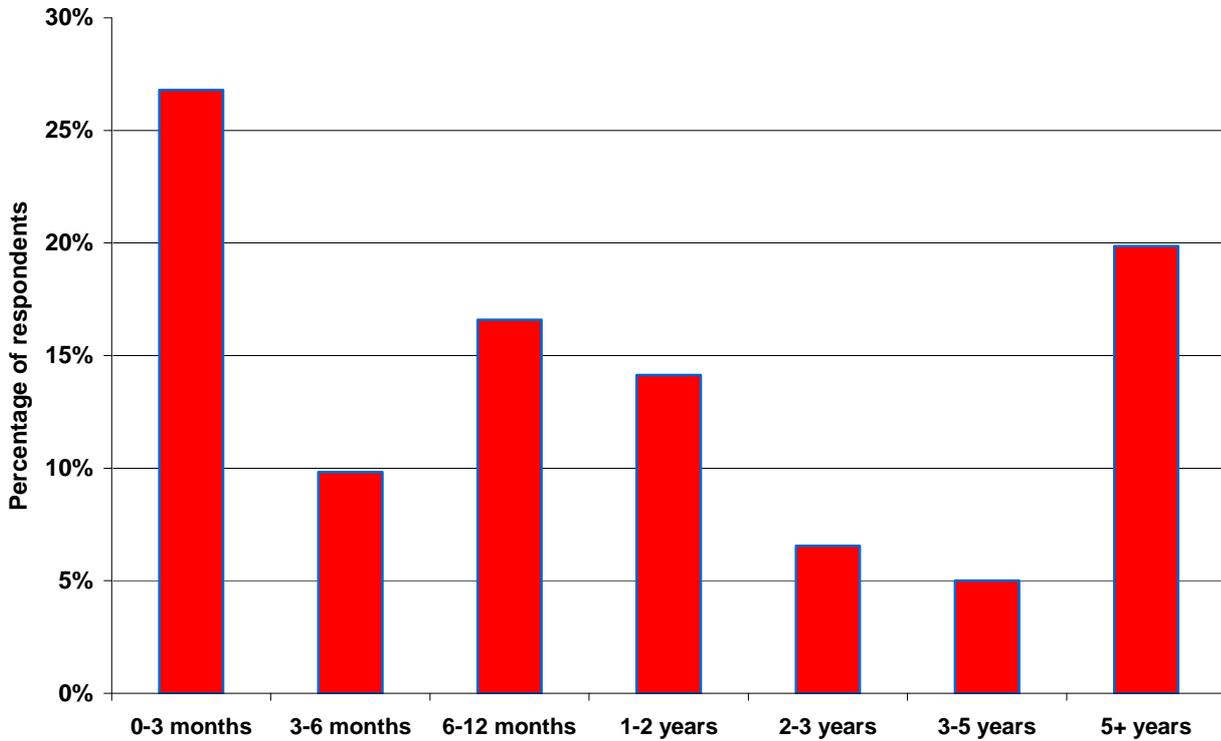


Reasons listed in the 'other' category include better remuneration, lower taxes, to accompany husband/wife and broader employment opportunities and work experience.

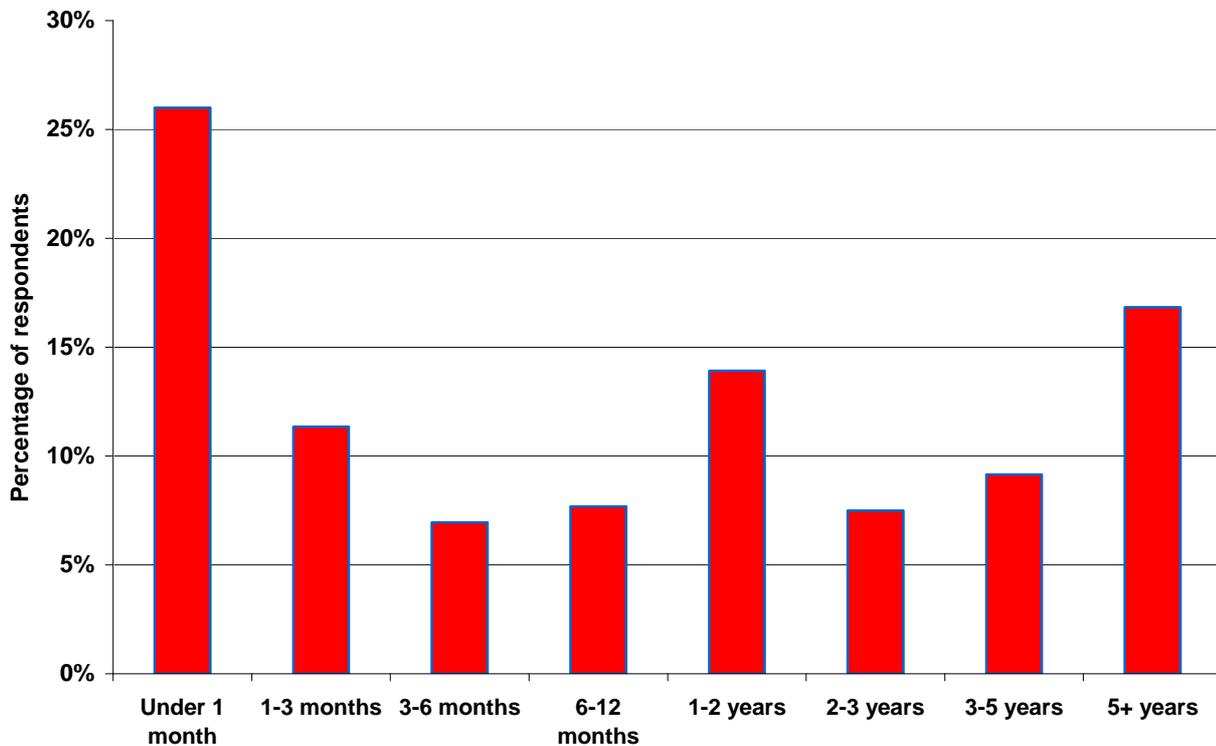
Fifty four percent of individuals who answered the survey worked overseas at least once every 12 months, with almost 70 percent of respondents working overseas at least once in a two year period.

Just over 52 percent of individuals normally stayed overseas for less than one year, with over 25 percent staying longer than three years. This movement is outlined in Figures A.6 and A.7.

**Figure A.6: How often Australian engineers work overseas**

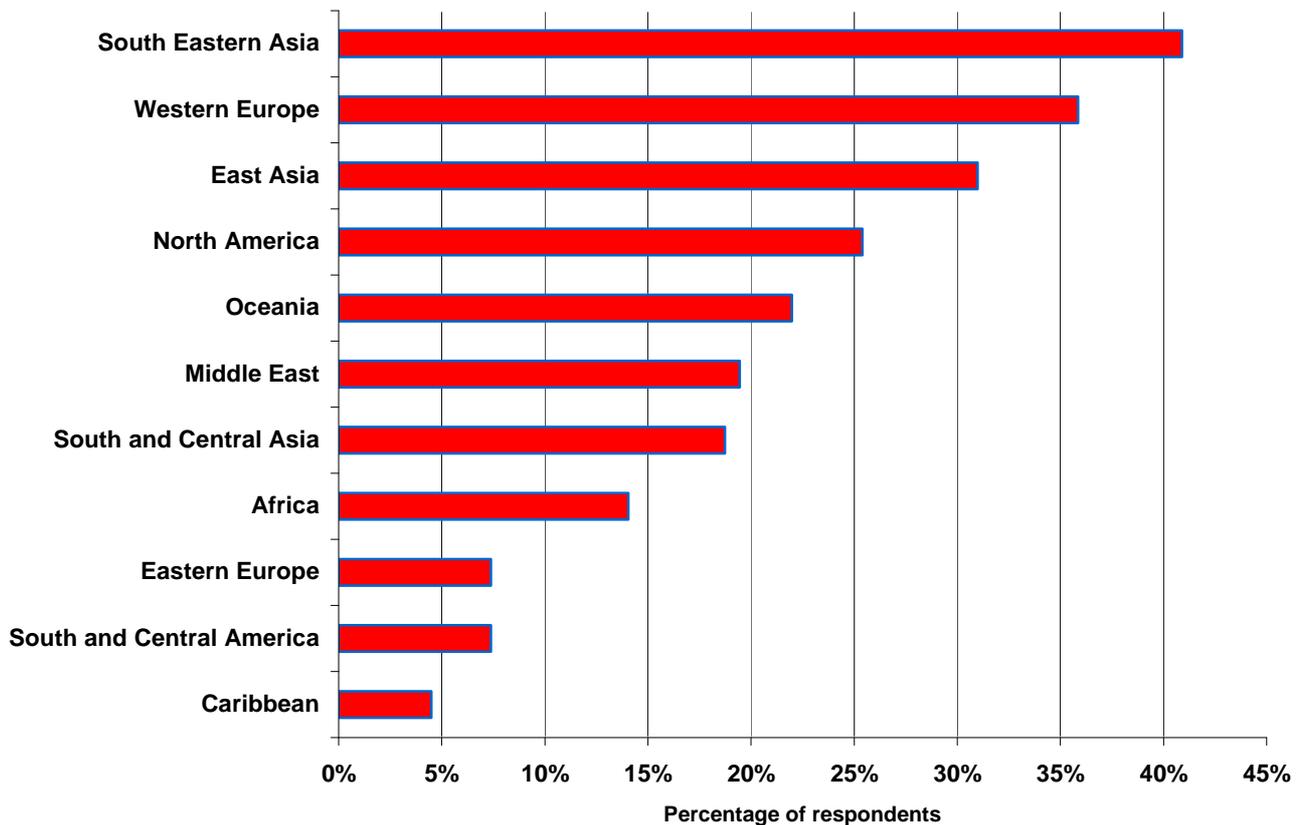


**Figure A.7: Period of time spent overseas each visit**



According to the Engineers Australia survey, Australian engineers are working in countries around the globe both for Australian companies with overseas offices and as employees of overseas companies. Understandably, given Australia's geographic location, 91 percent of respondents have worked in the Asian region, as outlined by Figure A.8.

**Figure A.8: Regions where engineers have worked "in country"**



Australian engineers also place great value on the experience they have gained from working internationally. When asked, "Do you believe your career has benefited from your time overseas" 94 percent answered, "Yes". Over 400 individual engineers also listed a variety of skills and experience that they have gained overseas that they believe they could not have obtained in Australia including:

- Exposure to a broader scope of engineering projects;
- Access to innovative expertise;
- Opportunity for higher salary and/or lower taxes;
- Higher level of responsibility on larger projects at a younger age;
- Opportunity for working on challenging projects;
- Experience of living in different cultures with different languages;
- Opportunity to travel extensively in other parts of the world;
- Exposure to alternative engineering processes, standards and techniques;

- Increased number of engineering & business contacts at all levels;
- Exposure to a broader range of engineering projects and also more opportunity to work through various phases of those projects, i.e. maintaining input through investigation, design and construction;
- Different range of projects, greater budgets and different clients; and
- Exposure to different business practices, exposure to a wider range of job responsibilities.

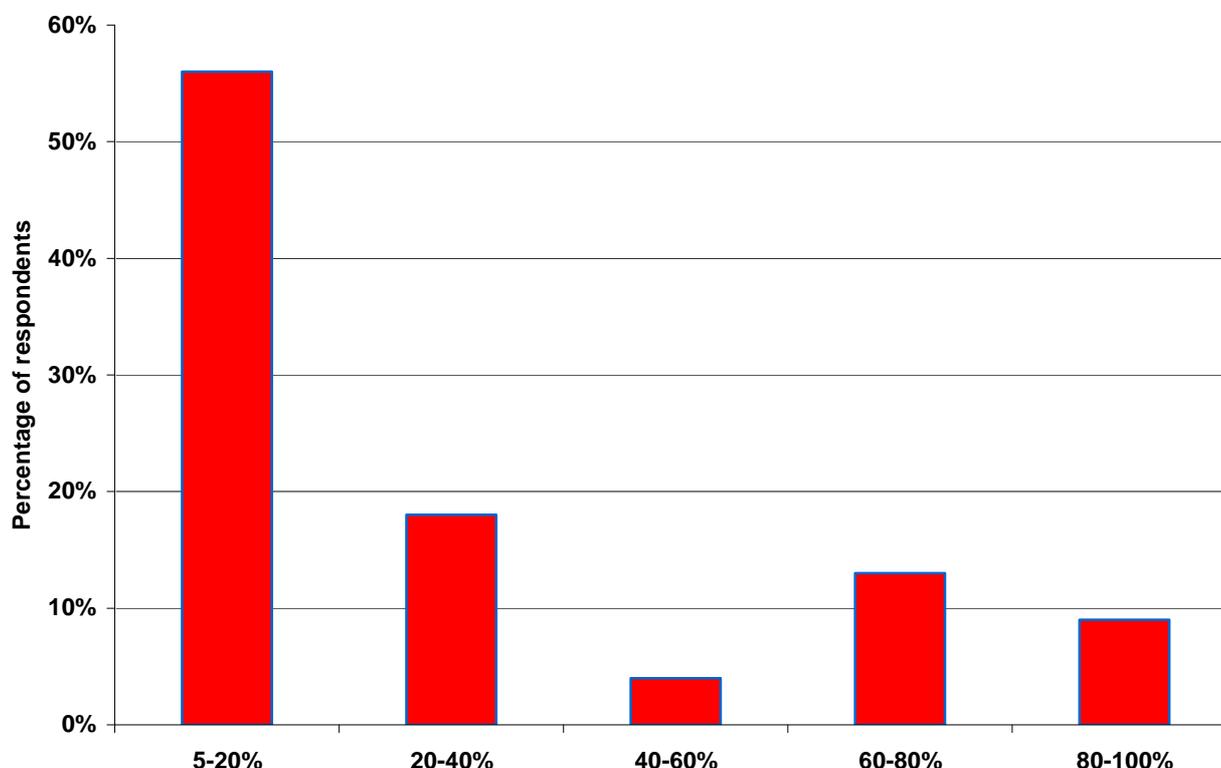
Further supporting the global nature of trade in engineering and the importance of the skills exchange related to the temporary migration of labour, 54 percent of survey respondents regularly had engineers from other countries working with them in Australia.

### ***Use of outsourcing***

Forty-four percent of companies that responded to the survey, indicated that they had design work carried out overseas for a mix of Australian domestic, and international projects. Of this 44 percent, three quarters sourced up to 40 percent of their design work from overseas.

More than one-fifth of respondents indicated that they sourced between 60 and 100 percent of their design work from overseas. A company, outsourcing all of its design services overseas, would be a significant participant in international trade in engineering services, including technology transfer and investment flows. These results are outlined in Figure A.9.

**Figure A.9: Percentage of design work sourced overseas**



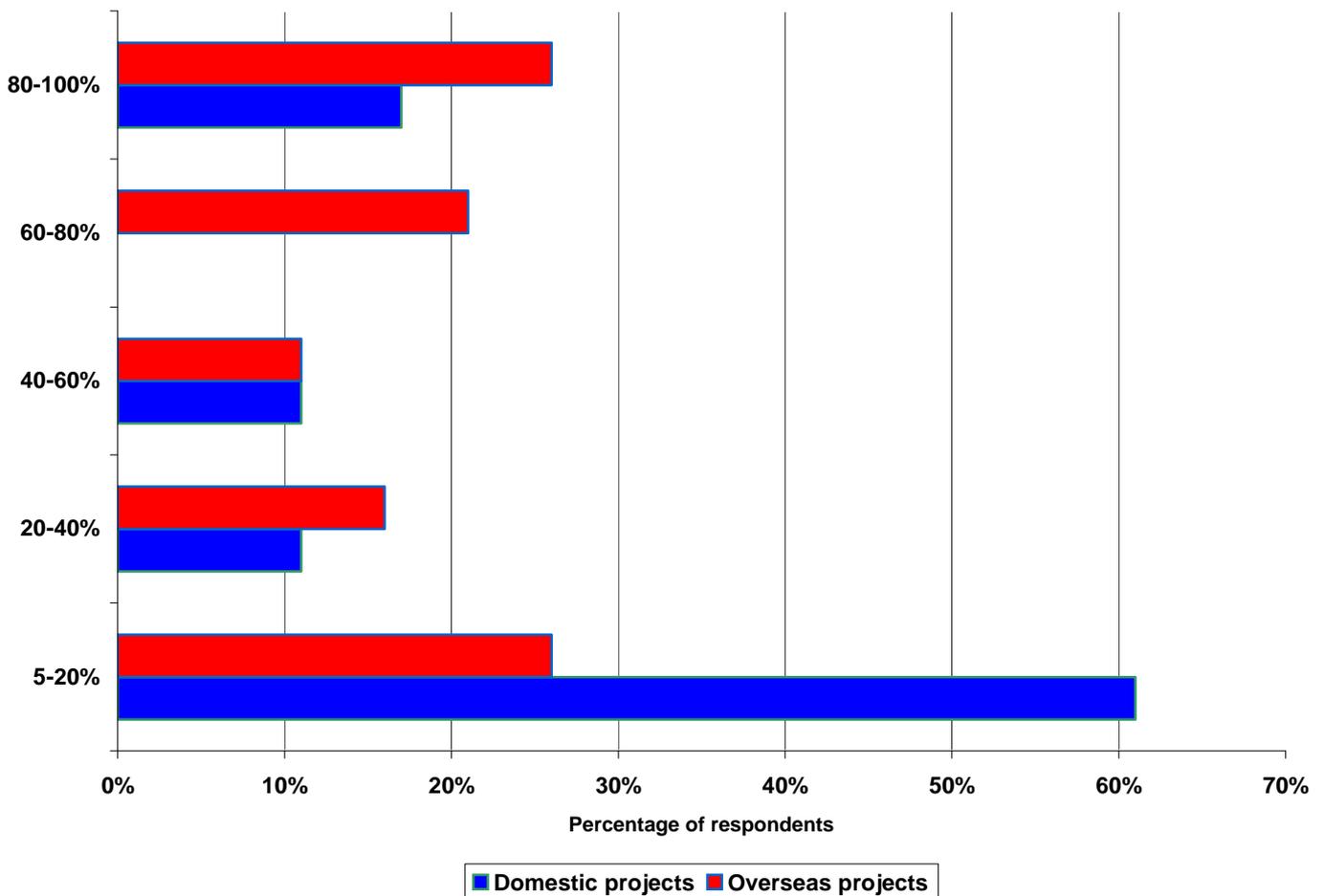
## Australia's relationship with ASEAN

The main overseas providers of engineering design services, to companies that responded to our survey, are based in Western Europe, Asia and North America. Forty percent of companies used providers based in Western Europe; 30 percent of companies used providers in East Asia or North America; while 20 to 25 percent of companies used providers in South, Central or South East Asia.

Combined, 75 percent of respondent companies used providers from the Asian region. Particular countries, outlined by survey respondents as providers of engineering design services to their companies, include: China, the US, Argentina, India, the United Arab Emirates, Germany, the Philippines, Singapore, Malaysia, Korea and New Zealand.

One company also indicated that its policy was to use “*design services in the country where the work is being undertaken*”, which might help explain the distribution of the use of overseas design services in Figure A.10.

**Figure A.10: Use of outsourcing: domestic and overseas projects**

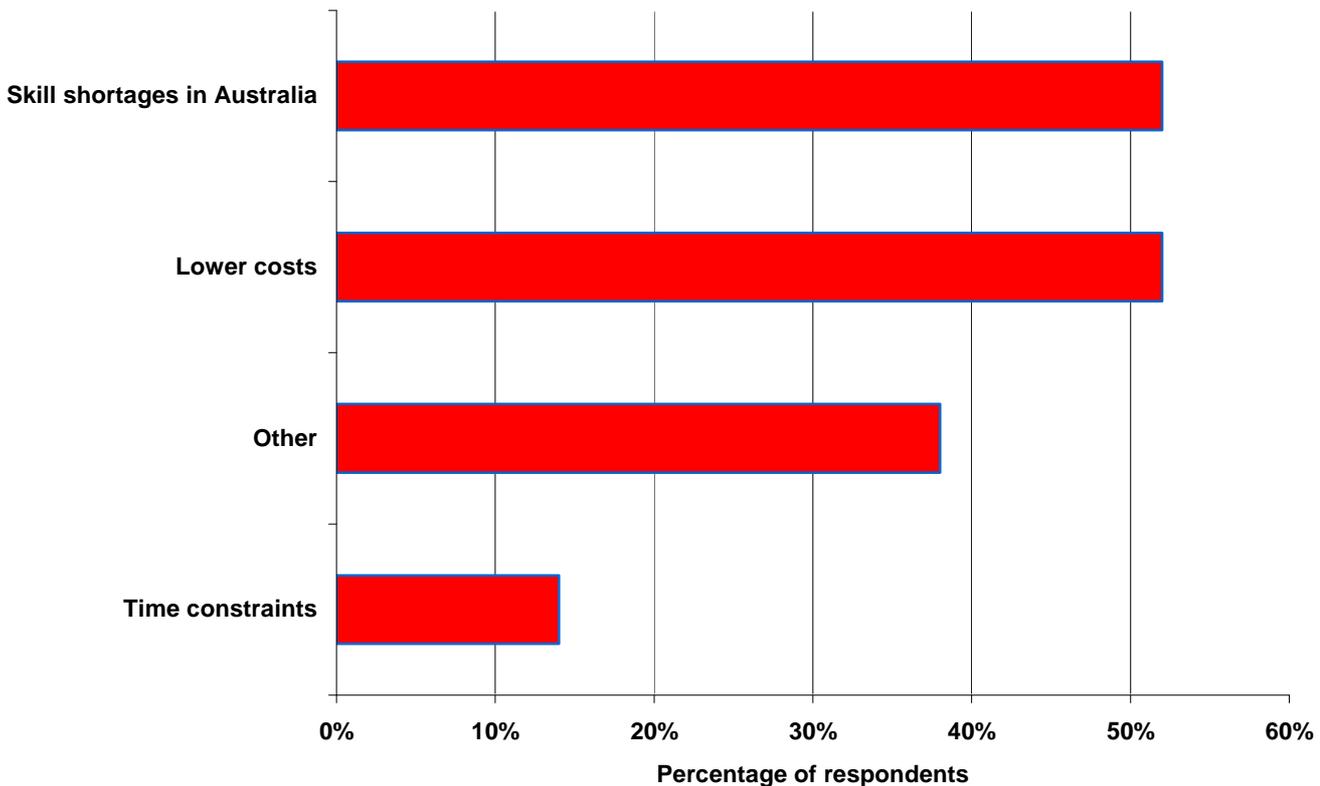


For domestic projects, almost two-thirds of respondent companies used overseas design services for up to 20 percent of the projects they undertake. For overseas projects, a quarter of the companies used an overseas provider to produce 80 to 100 percent of the design work.

There seems to be a correlation with projects overseas using higher rates of overseas design teams. However, regardless of whether the project is in Australia or not, overseas design teams are used to a significant extent.

Companies identified that the two key drivers of this shift to use overseas design services were to overcome skill shortages in Australia and to lower costs. Time constraints were cited by 14 percent of respondents as another key consideration as outlined in Figure A.11.

**Figure A.11: Reasons for outsourcing**



Respondents in the 'other' category cited an additional set of reasons including:

- To avoid competition over intellectual property;
- To access expert 'centres of excellence' and harness the expertise of employees in our own overseas offices; and
- Proximity to manufacturing facilities.

Just over 40 percent of companies used 24-hour design teams around the globe to meet project deadlines. A similar percentage, though not necessarily the same companies, had the management of the design team based in the country where the project was being delivered. Three-quarters of the companies surveyed used 24-hour design teams for up to 20 percent of the time.

### **Growth of international work**

As the excellence of Australian engineering companies has become more widely known across the globe, the amount of work being undertaken by Australian engineering companies overseas has increased. Sixty four percent of companies, who responded to the survey, said that the proportion of their overseas work is increasing. As this occurs, more Australians are working overseas in the offices of Australian companies, and Australian companies are increasingly accessing overseas design services for both domestic and international projects.

Driving the growth of Australian engineering companies has been the high quality of the projects completed by Australian engineers and engineering companies domestically and internationally.

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