



1. INTRODUCTION

Skills shortages are impacting Australia's productivity. While there is anecdotal evidence of the reasons behind skills shortages there is little hard evidence of the issues and the areas most affected in the consulting engineering industry. Continued shortages of skilled engineering professionals impact on the productivity and profitability of consulting engineering firms. This in turn impacts on the competitiveness of Australia, innovation and productivity.

ACEA prepared a comprehensive survey questionnaire that aims to gather evidence to identify the nature and impacts of professional engineering shortages in firms. The objective is to identify solutions and mitigate the impact of skills shortages on ACEA consulting engineering firms. This is the third skills survey conducted by ACEA since its introduction in 2005.

2. RESULTS SUMMARY

Question 1: What impact has shortages of professional engineers had on your firm within the last two years?

The most significant impacts of skills shortages identified by the respondents are:

1. Increased pressure on existing staff (85%);
2. Escalation of salaries (74%) and;
3. Reduced ability to meet client deadlines (65%).

Looking at the impacts identified within each firm size grouping the following impacts are revealed:

Small firms:

1. Increased pressure on existing staff (59%);
2. Reduced ability to meet client deadlines (53%) and;
3. Escalation of salaries (53%).

Medium firms:

1. Increased pressure on existing staff (94%);
2. Escalation of salaries (88%) and;
3. Poaching of staff (75%).

Also it was noted that (75%) of medium firm respondents also highlighted an increase in recruitment from overseas and a reduced ability to meet client deadlines.

Large firms:

1. Increased pressure on existing staff (100%);
2. Reduced ability to meet client deadlines (100%) and;
3. Poaching of staff (100%).

These results show that human resources costs are increasing because of pressure on staff whilst business capacity and growth is decreasing because businesses are struggling to meet their existing deadlines. These results accord with the current decline in productivity in Australia.

Question 2: If the engineering skills shortage continues, what actions will your firm have to take and how easily will your firm be able to implement them?

If skills shortages continue 100% of respondents said that they will have to increase salaries further in an attempt to attract or retain staff and 67% believe that this will be difficult to implement. 98% of respondents said that they will have to increase costs to clients and 72% that this would be difficult to implement (this is likely



because the building and construction market is highly competitive and because of the significant market power of the client base). A total of 67% of respondents said that they would increase recruitment from overseas and that this will be difficult to implement.

These results are indicative of the recent inflationary pressure that Australia has been experiencing.

A breakdown by firm size shows the following:

Small firms:

Small firms believe that they will have to increase costs to clients (65%), increase salaries (70%), increase budget spent on Human Resources (HR) (75%), and consider mergers with other firms (65%), even though these actions will be difficult to implement with clients.

Medium firms:

100% agreed that they would have to increase recruitment from overseas, but 75% said that this would be difficult to implement. Overall respondents stated that costs would increase (69%) and project time (56%) would have to be increased as well as increased budget spent on HR (63), again all these increases will be difficult to implement.

Large firms:

100% of large firm respondents said that they would need to increase cost to clients and (90%) said that this would be difficult to implement. 100% of large firms also identified that there would be an increase in project delivery time, but the majority (90%) said that this will be difficult to implement. 100% of large firms also identified that they would have to increase recruitment from overseas, but the majority (80%) said that this will be difficult to implement. The majority of large firms also said that they would increase salaries and limit the scale and scope of tenders.

Question 3: At which stage in the employee's life cycle is your firm experiencing most problems?

The responses show that in all stages of the employee's life cycle there are problems with skills shortages. The stage that is particularly prone to shortage is mid-level (i.e. 5-10 years experience), with 69% of respondents indicating shortages in this area. Entry levels (i.e. 2-4 years experience) are also in short supply with 52% of respondents indicating shortages. Medium and large firms on average indicated that over 70% of firms were struggling to find engineers with 2-10 years experience.

Question 4: Which engineering disciplines offered by your firm have been most affected by shortages and why?

The engineering disciplines most affected are civil (identified by 57% of all respondents) and structural (identified by 50% of all respondents). Both civil drafters (identified by 48% of all respondents) and structural drafters (identified by 50% of all respondents) have also been identified as most impacted by skills shortages.

50% of small firms who specialise in the engineering discipline of civil engineering identified shortages in that discipline. 50% of medium size firms specialising in civil engineering recorded shortages and 30% of large firms specialising in civil engineering recorded a shortage in this area.

Looking at structural engineers 50% of small firms, 56% of medium firms and, 40% of large firms recorded a shortage.

A breakdown of the other disciplines by firm grouping reveals the following (in addition to the shortages identified in civil and structure engineers):

Large firms:

Large firms who specialise in the following engineering disciplines also recorded shortages in that area; Mechanical, Drafting – Mechanical, Geotechnics, Water, Traffic transport, Engineering Management, Electrical Production or Plant, Biomedical and Hydraulic/fire.

Medium firms:

Medium firms who specialise in the following engineering disciplines also recorded shortages in that area; Mechanical, Drafting – Mechanical, Geotechnics, Water, Traffic transport, Engineering Management, Electrical, Mining, Marine, Construction Project Manager, Production or Plant, Biomedical and Hydraulic/fire.

Small firms:

Small firms who specialise in the following engineering disciplines also recorded shortages in that area; Mechanical, Drafting – mechanical, Construction project manager, Traffic/Transport, Industrial, Biomedical, chemical, Drafting electrical, Drafting –other, Geotechnics, Water and Environmental.

Question 5: Which of the following areas does your firm predominately undertake activities?

The results showed the following areas of activity:

Large firms:

Feasibility reports and studies (100%), Environmental improvement (90%), Sewerage and Water Systems (90%), Bridges (90%) and Tunnels (90%).

Medium firms:

Low rise building (69%), Schools hospital community facilities (56%), High Rise building (56%), Sewerage and Water systems (50%) and Bridges (50%).

Small firms:

Low rise buildings (75%), Individual dwellings (50%), Schools, hospitals, community buildings (40%) and Specialist services (35%).

Question 6: Where does your firm regularly undertake work?

Firm regularly undertake work in all Australian States and Territories, including regional, remote and metropolitan areas. The responses received showed that most activity takes place in New South Wales (metropolitan 46% regional 50% remote 15%). This is followed closely by Queensland (metropolitan 43% regional 39% remote 20%) and Western Australia (metropolitan 22% regional 26% remote 13%).

Question 7: In which geographical area has your firm most been affected by skills shortages over the last 2 year?

The geographical areas identified as most affected by skills shortages are:

- NSW Metropolitan - (43%);
- QLD Metropolitan - (33%);
- QLD Regional - (30%);
- VIC Metropolitan - (24%);
- NSW Regional - (22%) and;
- WA Metropolitan - (20%).

Question 8: What are the major issues related to your firm's difficulties in recruiting enough GRADUATE OR ENTRY LEVEL engineers?

Half (50%) of all respondents said that graduates perceive that they will get higher salaries in other industries and therefore they are not attracted into a career in engineering.

This was followed closely by competition from other industries (41%), which accords with the perception that other industries can offer higher salaries. Other reasons given include an insufficient number of graduates available for firms to recruit (41%).

Graduates with double degrees are undesirable was also noted by 20% of firms as a major difficulty. Related to this is the perception of some respondents that the quality of graduates is poor (15%) because the skills on graduation are not immediately applicable the engineering disciplines that are most effected by shortages and in demand by the firm.

Question 9: How effective is the education system in meeting your firm's needs for ENTRY LEVEL engineers?

Whilst overall most firms believe that the education system is meeting the needs of the industry, (26%) said courses are too broad and do not cover specialist areas and (15%) of respondents said that the quality of course content is poor.

Large firms (30%) said that the quality of course content is poor. Both small (25%) and medium (25%) firms said the courses are too broad and do not cover specialist areas.

Question 10: What is your firm's average staff turnover ratio over the last two years (number of staff who leave % total number of staff x 100 = x%) and why have they left?

37% of respondents had a turnover of 10-20% of their staff in the last 2 years. This includes 80% of the large firms, 28% of the medium firms who responded and 15% of the small firms. Medium firms had the highest rate of turnover with 31% indicating a turnover of between 20-30%. Small firms had a much lower turnover ratio, 35% of small firms indicate no changes in staff and 30% of respondents indicated between 1-10%.

The main reasons given for loss of engineers from firms are (in priority order):

1. Staff perceiving that they can obtain higher salaries elsewhere (especially for mid level engineers 61% and entry level 46%).
2. Due to aggressive headhunting from other firms/industries (especially for mid level engineers 46% and senior level 37%).
3. Due to staff seeking alternatives that will offer greater work life balance (especially for mid level engineers 39% and senior level 20%).

The small and medium firm grouping also identified that entry and mid level engineers leave because they perceive lack of career progression, opportunities overseas and a better work/life balance.

Question 11: How do you recruit new staff?

89% of all respondents said they recruit new staff through newspapers with, 35% indicating they use the internet and 24% use recruitment companies. Respondents were least likely to use head hunters (70%) and industry journals (63%).

Question 12: What is your firm doing to RECRUIT professionally qualified staff and what percentage of your budget is spent on these activities?

Overall (54%) of respondents have a graduate recruitment programme. Despite the perceptions regarding salaries, 78% of firms said that they pay salaries above award rates and 70% said they use professional recruitment agencies in order to recruit staff. Looking at the responses by firm size the following is revealed.

Small firms:

Although 30% of respondents from the small firm responders said that they do not have a recruitment strategy, 75% of respondents said that they pay above award rates and use a professional recruitment agency to recruit staff. The majority (65%) of small firms who responded said they spent up to 2% of their budget on recruitment activities over the last year.

Medium firms:

81% of medium firm respondents said that they pay salaries above award rates. 81% use professional recruitment agencies and 63% also attend careers fairs and forums in order to recruit staff. Over half of medium firm respondents (69%) said they have a recruitment programme for graduates. While half of respondents from this group (50%) spent up to 2% of their budget on recruitment activities over the last financial year, 31% spent up to 5%.

Large firms:

Nearly all of large firms (90%) indicated that they use professional recruitment agencies, 90% also indicated they attend careers fairs and forums in order to recruit staff. Large firms (90%) also indicated they pay salaries above award rates. 30% of respondents have international graduate recruitment programmes and use an international recruitment agency. 40% of large firms respondents said that they spent up to 5% of their budget on recruitment activities over the last financial year with 30% spending up to 8%.

Question 13: What percentage of your recruitment comes from overseas?

39% of firms recruited less than 1% of their staff from overseas, although some respondents have recruited a higher percentage from overseas the numbers are small, e.g. 20% of respondents from the large firm group said that they have recruited more than 10% from overseas, but overall only 9% of respondents said they have recruited more than 10% from overseas.

Question 14: If your firm uses 457 visas, what is the current average processing time?

The fastest 457 visa processing time was under 15 days but only 2% of respondents indicated this time frame. Overall 24% of respondents indicated that the processing time was greater than 36 days.

Question 15: In the past 12 months has the total 457 visa processing time, increased decreased or stayed the same?

The majority of respondents indicated an increase in the processing time of a 457 visa. 5 weeks was the response most indicated by respondents but this was only 10% overall. 40% of large firms indicated an increase of 2 weeks and further 20% indicated a increase of 3 weeks.

Two firms in total (one medium and one large) indicated a decrease of two weeks in 457 visa processing.

Question 16: What is the average length of time spent filling a position?**Graduates:**

52% of all respondents said the average length of time spent filling a position for a graduate was 6-12 months. 13% indicated it took between 1-2 years to fill a graduate position.



Mid level:

When searching for mid level staff, up to 35% of all firms said it takes 6-12 months to find the right person. 9% of firms said it takes 1-2 years to fill a position and 7% of all firms said it takes as long as 2-5 years to find adequate staff.

Senior level:

When searching for senior level staff, up to 22% of respondents said it takes 6-12 months to find them. 17% of all firms said it takes 1-2 years to find staff and 7% said it takes 2-5 years to find a senior level staff person. 2% of all respondents said it takes 5 years + to find a senior level employee.

Principals:

When searching for principal level staff, up to 20% of all firms said it takes 6-12 months to fill the position. 15% of all firms said it takes 1-2 years to find staff and 7% of all firms said it takes 5 years + to find a principal level employee.

Question 17: What is the average salary your firm pays employees in the following categories?

Graduates:

The majority of firms pay above the award wage with only 22% of all the respondents paying on the award rate for a graduate. Although 40% of all small firms indicated they pay on the award rate. On average the award rate was exceeded by 25% for graduates. Large firms paid 33% above the award wage, small firms 21% and medium firms 20% above the award rate.

Mid level:

Only 11% of all respondents indicated they pay on the award rate for a mid level engineer. Large firms had the highest response in this category with 20% indicating they pay on the award rate. Mid level engineers on average received 29% above the award wage, with large firms paying 35% above the award wage, small firms and medium firms both respectively pay 25% and 24% above the award wage.

Senior level:

13% of all respondents indicated they pay on the award rate for a senior level engineer. 20% of small and medium firms paid on the award rate. Senior level engineers on average received 29% above the award wage, with large firms paying 47% above the award wage.

Principal:

Only 7% of all respondents indicated they pay on the award rate for a principal level engineer. Overall 33% respondents paid principal level engineers above the award wage, with large firms paying 46% above the award wage, medium firms paying 33% above the award rate and small firms 20%.

Question 18: What is your firm doing to RETAIN professionally qualified staff?

Overall the results show that again in spite of perceptions the majority of firms (87%) are paying salaries above award rates. Firms are also offering ongoing training and development to their staff (87%) and conducting regular staff appraisals (85%). Looking at the responses given by firm size grouping the following is revealed:

Small firms:

The clear majority of small firms (70%) pay salaries above the award rate. They also offer flexible working hours (75%) and conduct regular staff appraisals and offer ongoing training and development (75%).

Medium firms:

The majority of medium size firm respondents conduct regular staff appraisals 94% and offer ongoing training and development 94%, while 63% offer flexible working hours.

Large firms:

100% of large firm respondents conduct regular staff appraisals and offer ongoing training and development. 90% recognise high achievers (e.g. enter into industry awards). 90% of large firms give staff opportunities to work overseas through their overseas offices, 90% offer more flexible working hours and 70% have staff incentive schemes. 100% conduct regular staff appraisals and offer staff benefit packages (e.g. gym membership and private health insurance).

Question 19: What percentage of total operating turnover are you using to fund training and professional development?

Overall 3.8% of turnover was spent by firms on training and professional development. Small firms spent the same as the overall average 3.8%. Medium firms spent the most at 5.5% and with large firms at 2.1%.

Question 20: How many engineers have been employed by your firm in the following time frame?

The response differed as expected with size of firm. In the last year small firms employed 2 new employees, medium firms 17 and large firms 160 new employees. Over the last 5 years small firms employed 1.5 new employees, medium firms 13 and large firms 323 new employees. In the previous 5 years small firms employed 1.25 new staff members, medium firms 9 and large firms 83 new employees. The results over the latest 5 year period reflect strong growth and demand for qualified professional staff in the consulting engineering industry.

Question 21: What percentage of your firms male and female employees fall into the following categories?

The majority of workplaces remain male dominated. Males represented over 60% for both entry level and mid level engineers. Senior and Principals both represent around 75% of the firms surveyed. Females represented 32% of entry level and mid level 20%. Only 10% of females were represented at senior and 5% at the Principal level.

Question 22: Can you suggest what should happen in the following areas to improve the number of available GRADUATES/ENTRY LEVEL Engineers?

A summary of responses is provided below, setting out the actions which should be taken by different stakeholders.

The Government (in order of priority):

- Improve the image of engineering as a rewarding career;
- Put a stronger emphasis on maths and science subjects in schools;
- Increase the education budget for engineering;
- Introduce tax incentives for engineering professionals,
- Introduce a trainee scheme.

Schools (in order of priority):

- Raise the profile of engineering as a rewarding career;
- Promote maths and science education in schools;
- Increase the involvement of engineering institutions and industry representatives in career days.

Higher Education (in order of priority):

- Raise the profile of engineering as a rewarding career;
- Develop course content to better reflect the skills needed in the engineering industry;
- Increase number of places available and increase financing of engineering courses.

Vocational Education and Training (in order of priority):

- Raise the profile of engineering as a rewarding career;
- Increase cooperative programs with the industry;
- Develop course content to better reflect the skills needed in the engineering industry.

ACEA (in order of priority):

- Work with Government and other organisations to highlight the benefits that engineers provide to the community;
- Raise the profile and improve the image of engineering as a rewarding career;
- Work with Government and other organisations to highlight the benefits that engineers provide to the community.

Your firm (in order of priority):

- Raise the profile and improve the image of engineering as a rewarding career;
- Offer work experience to students;
- Offer traineeships and provide more opportunities for career development.

Question 23: Can you identify what should happen in the following areas to improve the RETENTION OF EXPERIENCED/MID LEVEL engineers?

The Government (in order of priority):

- Lower taxation/offer tax incentives for regional workers;
- Offer more support to firms taking on trainees;
- Increase skilled migration;
- Raise the profile of engineering as a critical profession.

ACEA (in order of priority):

- Raise the profile of engineering as a rewarding career;
- Discourage aggressive headhunting between firms;
- Research and advice on retention strategies for members;
- Reduce membership fees for small firms i.e. less than 5 employees.

Your firm (in order of priority):

- Motivate staff and encourage the development of skills;
- Provide staff with rewarding and challenging work;
- Pay higher salaries/offer better incentives;
- Flexible Working Hours;
- Better define career paths and provide ongoing training & development.

Question 24: What is the size of your firm (total staff)?

24% of respondents have 1-5 employees and 20% have 5-19 employees. 15% of respondents have 100-500 staff, and 13% have 1000-2000. 6% of firms that responded indicated that they have over 2000 staff.



Question 25: What % of your total staff will be retiring within 5 years or 10 years? What is the average retiring age for your firms?

The results showed that 6.9% of staff will be retiring within 5 years.15% of total staff will be retiring within 10 years.

63 years is the average retiring age.

End of 2008 skills survey summary

3. FULL RESULTS

Question 1: What impact has shortages of professional engineers had on your firm within the last two years?

	Small		Medium		large		Total	
	Count	%	Count	%	Count	%	Count	%
No Impact	3	15%	0	0%	0	0%	3	7%
Downsizing not recruiting	1	5%	0	0%	0	0%	1	2%
Restricted business growth	9	45%	12	75%	4	40%	25	54%
Reduced ability to meet client deadlines	11	55%	12	75%	7	70%	30	65%
Increased pressure on existing staff	14	70%	15	94%	10	100%	39	85%
Escalation of salaries	10	50%	14	88%	10	100%	34	74%
Increase in recruiting from overseas	7	35%	12	75%	10	100%	29	63%
Staff being poached	5	25%	10	63%	9	90%	24	52%
Reduced capacity for tender	6	30%	8	50%	4	40%	18	39%
Have/considering mergers	0	0%	3	19%	0	0%	3	7%
Filling traditional engineering roles with other qualifications	3	15%	1	6%	0	0%	4	9%

Comments:

- We are using engineers to do drafting;
- We are constantly worried that our staff will be poached by unethical agents or employers;
- Employees are being approached by other companies all the time.

Question 2: If the engineering skills shortage continues, what actions will your firm have to take and how easily will your firm be able to implement them?

	Total % Easy	Total % Difficult	Total % Impossible
Increase salaries	33%	67%	0%
Increase recruitment from overseas	22%	67%	11%
Increase budget spend on HR	30%	65%	4%
Increase cost to clients	22%	72%	7%
Increase project delivery time	24%	61%	15%
Diversify the business into non-engineering	22%	33%	46%
Consider mergers with other firms	15%	61%	24%
Limit the amount and scale of tenders	41%	54%	4%
Downsize your firm	20%	46%	35%
Retire from business	13%	26%	61%
Close your firm	15%	20%	65%

Question 3: At which stage in the employee's life cycle is your firm experiencing most problems?

QUESTION 3	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
Entry 1-2	10	50%	6	38%	6	60%	22	48%
2-4 years	10	50%	10	63%	7	70%	27	59%

Mid level 5 - 7	15	75%	12	75%	9	90%	36	78%
7-10 years	9	45%	8	50%	7	70%	24	52%
Senior level 10+	5	25%	8	50%	5	50%	18	39%
Principal level	2	10%	2	13%	4	40%	8	17%

Question 4: Which engineering disciplines offered by your firm have been most affected by shortages and why?

	Small		Small		Medium		Medium		Large		Large		Total Overall	
	No. firms in area		No Firms indicating shortage		No. firms in area		No Firms indicating shortage		No. firms in area		No firms indicating a shortage		No firms indicating a shortage	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Agriculture	0	0%	0	0%	0	0%	0	0%	1	10%	0	0%	0	0%
Hydraulic/fire	0	0%	3	15%	3	19%	2	13%	4	40%	1	10%	6	13%
Biomedical	0	0%	2	10%	0	0%	2	13%	1	10%	3	30%	7	15%
Industrial	0	0%	1	5%	1	6%	1	6%	2	20%	0	0%	2	4%
Chemical	0	0%	1	5%	0	0%	0	0%	2	20%	0	0%	1	2%
IT support	0	0%	0	0%	1	6%	0	0%	1	10%	0	0%	0	0%
Civil	10	50%	13	65%	12	75%	10	63%	9	90%	3	30%	26	57%
Marine	0	0%	2	10%	0	0%	1	6%	5	50%	0	0%	3	7%
Construction project manager	3	15%	5	25%	4	25%	4	25%	4	40%	0	0%	9	20%
Materials	0	0%	1	5%	0	0%	0	0%	0	0%	0	0%	1	2%
Drafting -Civil	7	35%	10	50%	10	63%	8	50%	8	80%	4	40%	22	48%
Mechanical	2	10%	3	15%	3	19%	4	25%	6	60%	1	10%	8	17%
Drafting - Electrical	0	0%	3	15%	1	6%	1	6%	5	50%	1	10%	5	11%
Mining (excluding petroleum)	1	5%	1	5%	1	6%	1	6%	4	40%	0	0%	2	4%
Drafting-Mechanical	1	5%	4	20%	1	6%	2	13%	5	50%	1	10%	7	15%
Process	0	0%	1	5%	1	6%	0	0%	1	10%	0	0%	1	2%
Drafting Structural	12	60%	10	50%	7	44%	9	56%	8	80%	4	40%	23	50%
Petroleum	0	0%	0	0%	0	0%	0	0%	1	10%	0	0%	0	0%
Drafting- Other	0	0%	2	10%	1	6%	1	6%	3	30%	0	0%	3	7%
Production Or Plant	0	0%	0	0%	0	0%	1	6%	2	20%	1	10%	2	4%
Electrical	0	0%	3	15%	3	19%	3	19%	6	60%	1	10%	7	15%
Structural	12	60%	12	60%	7	44%	9	56%	9	90%	2	20%	23	50%
Engineering Management	3	15%	4	20%	5	31%	3	19%	5	50%	1	10%	8	17%
Traffic Transport	0	0%	6	30%	6	38%	5	31%	9	90%	1	10%	12	26%
Environmental	2	10%	3	15%	4	25%	4	25%	7	70%	0	0%	7	15%
Water	0	0%	3	15%	8	50%	6	38%	8	80%	2	20%	11	24%
Geotechnics	0	0%	5	25%	5	31%	3	19%	7	70%	1	10%	9	20%

Question 5: Which of the following areas does your firm predominately undertake activities?

	Small		Medium		Large		Total	
	count	%	Count	%	Count	%	Count	%
R&D	3	15%	0	0%	0	0%	3	7%
Environmental improvement	3	15%	5	31%	9	90%	17	37%
Sewerage and Water Systems	5	25%	8	50%	9	90%	22	48%
Low rise building	15	75%	11	69%	3	30%	29	63%
Schools hospital community facilities	8	40%	9	56%	5	50%	22	48%
Dams	1	5%	6	38%	7	70%	14	30%
Bridges	1	5%	8	50%	9	90%	18	39%
Mines	1	5%	5	31%	5	50%	11	24%
Industrial and commercial survey	2	10%	1	6%	2	20%	5	11%
Improvement	1	5%	0	0%	2	20%	3	7%
Energy	1	5%	3	19%	6	60%	10	22%
High Rise building	5	25%	9	56%	5	50%	19	41%
Road surveys	2	10%	7	44%	8	80%	17	37%
Feasibility reports and studies	6	30%	5	31%	10	100%	21	46%
Specialist services	7	35%	5	31%	4	40%	16	35%
Oil & Gas	0	0%	1	6%	3	30%	4	9%
Tunnels	0	0%	2	13%	9	90%	11	24%
Modular Dwellings	2	10%	4	25%	2	20%	8	17%
Individual dwellings	10	50%	5	31%	1	10%	16	35%

Other disciplines:

- Mechanical & steel structural design, FEA and certification
- Forensic engineering;
- Mid rise buildings, medium to large warehouses, safety engineering;
- Transport, risk assessment;
- Highways & transportation;
- Architecture, international development.

Question 6: Where does your firm regularly undertake work?

	Small		Medium		Large		Total	
	count	%	count	%	count	%	count	%
ACT Regional	1	5%	6	38%	2	20%	9	20%
ACT Remote	0	0%	2	13%	0	0%	2	4%
ACT Metropolitan	1	5%	4	25%	5	50%	10	22%
QLD Regional	3	15%	8	50%	7	70%	18	39%
QLD Remote	1	5%	4	25%	4	40%	9	20%
QLD Metropolitan	4	20%	9	56%	7	70%	20	43%
NSW Regional	10	50%	7	44%	6	60%	23	50%
NSW Remote	0	0%	3	19%	4	40%	7	15%
NSW Metropolitan	8	40%	6	38%	7	70%	21	46%
TAS Regional	1	5%	1	6%	1	10%	3	7%
TAS Remote	1	5%	1	6%	1	10%	3	7%
TAS Metropolitan	1	5%	1	6%	0	0%	2	4%

NT Regional	1	5%	2	13%	4	40%	7	15%
NT Remote	1	5%	2	13%	3	30%	6	13%
NT Metropolitan	1	5%	2	13%	3	30%	6	13%
VIC Regional	3	15%	3	19%	6	60%	12	26%
VIC Remote	1	5%	1	6%	4	40%	6	13%
VIC Metropolitan	2	10%	3	19%	6	60%	11	24%
SA Regional	1	5%	2	13%	5	50%	8	17%
SA Remote	0	0%	2	13%	2	20%	4	9%
SA Metropolitan	2	10%	2	13%	4	40%	8	17%
WA Regional	3	15%	3	19%	6	60%	12	26%
WA Remote	1	5%	1	6%	4	40%	6	13%
WA Metropolitan	2	10%	2	13%	6	60%	10	22%

Work undertaken overseas:

Iran, Chile, Africa, Asia, New Zealand, Singapore, China, Indonesia.

Question 7: In which geographical area has your firm most been affected by skills shortages over the last 2 year?

	Small		Medium		Large		Total	
	count	%	count	%	count	%	count	%
All states	0	0%	1	6%	2	20%	3	7%
ACT Regional	2	10%	4	25%	2	20%	8	17%
ACT Remote	0	0%	2	13%	1	10%	3	7%
ACT Metropolitan	1	5%	5	31%	3	30%	9	20%
QLD Regional	2	10%	5	31%	7	70%	14	30%
QLD Remote	1	5%	2	13%	2	20%	5	11%
QLD Metropolitan	0	0%	7	44%	8	80%	15	33%
NSW Regional	2	10%	4	25%	4	40%	10	22%
NSW Remote	0	0%	1	6%	2	20%	3	7%
NSW Metropolitan	7	35%	5	31%	8	80%	20	43%
TAS Regional	1	5%	1	6%	1	10%	3	7%
TAS Remote	1	5%	1	6%	1	10%	3	7%
TAS Metropolitan	0	0%	1	6%	1	10%	2	4%
NT Regional	0	0%	2	13%	3	30%	5	11%
NT Remote	1	5%	2	13%	3	30%	6	13%
NT Metropolitan	1	5%	2	13%	3	30%	6	13%
VIC Regional	0	0%	2	13%	5	50%	7	15%
VIC Remote	0	0%	1	6%	3	30%	4	9%
VIC Metropolitan	1	5%	4	25%	6	60%	11	24%
SA Regional	1	5%	2	13%	4	40%	7	15%
SA Remote	0	0%	1	6%	3	30%	4	9%
SA Metropolitan	0	0%	2	13%	2	20%	4	9%
WA Regional	0	0%	3	19%	5	50%	8	17%
WA Remote	0	0%	1	6%	4	40%	5	11%
WA Metropolitan	2	10%	1	6%	6	60%	9	20%

Other:

Skills shortages were also recorded by respondents in Iran, Africa, and UAE. The reasons given were:

- Overseas security issues;
- No one wants to travel to Africa;
- Skills not available/lack of skills in market place.

Question 8: What are the major issues related to for your firm's difficulties in recruiting enough GRADUATE OR ENTRY LEVEL engineers?

	Small		Medium		Large		Total	
	count	%	count	%	count	%	count	%
There are insufficient number of graduates	8	40%	5	31%	6	60%	19	41%
The quality of graduates is poor	6	30%	1	6%	0	0%	7	15%
Graduates perceive they can get higher salaries elsewhere	10	50%	7	44%	6	60%	23	50%
Graduates have a low opinion of a career in engineering	0	0%	2	13%	0	0%	2	4%
Competition from other industries	5	25%	6	38%	8	80%	19	41%
Graduates with double degrees are undesirable	6	30%	2	13%	1	10%	9	20%
We are unable to compete with other firms graduate recruitment programs	1	5%	0	0%	0	0%	1	2%
There are insufficient numbers of female graduates	2	10%	3	19%	2	20%	7	15%
Graduates don't consider they can enter into consulting engineering after degree	5	25%	0	0%	3	30%	8	17%

Comments:

- Small firm turnover means that they cannot afford to train graduates;
- Graduates think that big is best and are most interested in large companies with training programs;
- Graduates have unrealistic expectations of salaries, career progression timeframes and opportunity to travel o/s;
- We experience difficulty recruiting graduates for regional areas in Queensland, NT and Wollongong.

Question 9: How effective is the education system in meeting your firm's needs for ENTRY LEVEL engineers?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
Effective : There is a high standard of student graduates	10	50%	15	94%	10	100%	35	76%
Effective : Course content is appropriate to my firms needs	19	95%	16	100%	10	100%	45	98%
Effective : There is a high standard of teaching quality	14	70%	13	81%	10	100%	37	80%
Ineffective : Courses are too broad and do not cover specialist areas	5	25%	4	25%	3	30%	12	26%
Ineffective : The quality of teaching is poor	3	15%	3	19%	0	0%	6	13%
Ineffective : The quality of course content is poor	3	15%	2	13%	2	20%	7	15%

Comments:

- Civil Engineering is not taught in the ACT;
- Lack of understanding of business requirements and expectations. Perhaps due to lecturers not having recent practical experience of the working world;
- NSW – the quality of teachers varies per university.

Question 10: What is your firm's average staff turnover ratio over the last two years (number of staff who leave % total number of staff x 100 = X %) and why have they left?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
0%	7	35%	0	0%	0	0%	7	15%
1-10%	6	30%	5	31%	1	10%	12	26%
10-20%	3	15%	6	38%	8	80%	17	37%
20-30%	1	5%	5	31%	1	10%	7	15%
30-40%	1	5%	0	0%	0	0%	1	2%
50-60%	0	0%	0	0%	0	0%	0	0%
60-70%	0	0%	0	0%	0	0%	0	0%
70-80%	0	0%	0	0%	0	0%	0	0%
80-90%	0	0%	0	0%	0	0%	0	0%
90-100%	0	0%	0	0%	0	0%	0	0%

Comments:

Question 11: How do you recruit new staff?

	Never		Sometimes		Always	
	Total Count	Total %	Total Count	Total %	Total Count	Total %
Newspapers	0	0%	5	11%	41	89%
Industry Journals	29	63%	16	35%	1	2%
Internet	9	20%	21	46%	16	35%
Recruitment Companies	12	26%	23	50%	11	24%
Head Hunters	32	70%	14	30%	0	0%
Staff introduction Incentives	18	39%	18	39%	10	22%
Career Fairs	22	48%	19	41%	5	11%

Comments:

- Applications received by graduates /candidate cold call/ word of mouth;
- Recruitment of University students who stay on post graduation;
- Our website;
- E-mail to graduating students at University through University careers centres.

Question 12: What is your firm doing to RECRUIT professionally qualified staff and what percentage of your budget is spent on these activities?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
Our firm does not have a recruitment strategy/program	6	30%	4	25%	0	0%	10	22%
We use professional recruitment agency	10	50%	13	81%	9	90%	32	70%
We attend/display at career fairs /forums	1	5%	10	63%	9	90%	20	43%
We have a graduate recruitment program	5	25%	11	69%	9	90%	25	54%
We pay salaries above the award rate	15	75%	13	81%	8	80%	36	78%

We have an international graduate recruitment program	2	10%	2	13%	1	10%	5	11%
We attend international careers fairs & forums	1	5%	4	25%	3	30%	8	17%
We use a international recruitment agency	2	10%	4	25%	3	30%	9	20%
Percentage of turnover spent recruiting new staff	Small		Medium		Large		Count	Total
0-2%	13	65%	8	50%	1	10%	22	48%
2-5%	4	20%	5	31%	4	40%	13	28%
5-8%	0	0%	3	19%	3	30%	6	13%
8-10%	0	0%	0	0%	1	10%	1	2%
10-15%	1	5%	0	0%	0	0%	1	2%
15% and over	0	0%	0	0%	0	0%	0	0%

Question 13: What percentage of your recruitment comes from overseas?

		Small		Medium		Large		Total	
		Count	%	Count	%	Count	%	Count	%
Percentage of staff directly recruited from overseas	<1%	11	55%	7	44%	0	0%	18	39%
	1-2%	0	0%	1	6%	1	10%	2	4%
	2-5%	1	5%	3	19%	3	30%	7	15%
	5-10%	2	10%	4	25%	4	40%	10	22%
	>10%	2	10%	0	0%	2	20%	4	9%
Percentage of staff already in Australia from overseas and recruited by your firm	<1%	3	15%	4	25%	2	20%	9	20%
	1-2%	0	0%	3	19%	1	10%	4	9%
	2-5%	1	5%	3	19%	3	30%	7	15%
	5-10%	1	5%	3	19%	2	20%	6	13%
	>10%	6	30%	1	6%	1	10%	8	17%

Question 14: If your firm uses 457 visas, what is the current average processing time?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
0-5 days	0	0%	0	0%	0	0%	0	0%
6-10 days	0	0%	0	0%	0	0%	0	0%
11-15 days	0	0%	1	6%	0	0%	1	2%
16-20 days	0	0%	2	13%	1	10%	3	7%
21-25days	0	0%	0	0%	3	30%	3	7%
26-30 days	0	0%	3	19%	3	30%	6	13%
31-35days	1	5%	1	6%	0	0%	2	4%
>36 days	3	15%	5	31%	3	30%	11	24%

Question 15: In the past 12 months has the total 457 visa processing time, increased decreased or stayed the same?

Increase / Decrease	Small		Medium		Large	
	Count	%	Count	%	Count	%
1 Week						Increase x1
2 Weeks			Decrease x 1	Increase x1	Decrease x1	Increase x4

3 Weeks			Increase x2
4 Weeks		Increase x1	
5 Weeks +	Increase x1	Increase x3	Increase x1

Question 16: What is the average length of time spent filling a position?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
Graduate 0-6 months	1	5%	2	13%	1	10%	4	9%
Graduate 6-12 months	5	25%	10	63%	9	90%	24	52%
Graduate 1-2 years	5	25%	1	6%	0	0%	6	13%
Graduate 2-5 years	1	5%	0	0%	0	0%	1	2%
Graduate 5+ years	1	5%	0	0%	0	0%	1	2%
Mid 0-6 months	3	15%	5	31%	6	60%	14	30%
Mid 6-12 months	5	25%	7	44%	4	40%	16	35%
Mid 1-2 years	3	15%	1	6%	0	0%	4	9%
Mid 2-5 years	3	15%	0	0%	0	0%	3	7%
Mid 5+ years	0	0%	0	0%	0	0%	0	0%
Senior 0-6 months	1	5%	3	19%	8	80%	12	26%
Senior 6-12 months	3	15%	5	31%	2	20%	10	22%
Senior 1-2 years	3	15%	5	31%	0	0%	8	17%
Senior 2-5 years	3	15%	0	0%	0	0%	3	7%
Senior 5+ years	1	5%	0	0%	0	0%	1	2%
Principal 0-6 months	0	0%	3	19%	5	50%	8	17%
Principal 6-12 months	1	5%	3	19%	5	50%	9	20%
Principal 1-2 years	0	0%	7	44%	0	0%	7	15%
Principal 2-5 years	0	0%	0	0%	0	0%	0	0%
Principal 5+ years	2	10%	1	6%	0	0%	3	7%

Question 17: What is the average salary your firm pays employees in the following categories?

Question 17	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
On Award Graduate	8	40%	1	6%	1	10%	10	22%
On award Mid	3	15%	0	0%	2	20%	5	11%
On award Senior	4	20%	0	0%	2	20%	6	13%
On award Principal	1	5%	0	0%	2	20%	3	7%
Above Award wage Graduate		21%		20%		33%		25%
Above Award wage Mid		25%		24%		35%		29%
Above Award wage Senior		19%		31%		47%		32%
Above Award wage Principal		20%		33%		46%		33%

Question 18: What is your firm doing to RETAIN professionally qualified staff?

	Small		Medium		Large		Total	
	Count	%	Count	%	Count	%	Count	%
Our firm does not have a retention strategy	6	30%	4	25%	0	0%	10	22%
We conduct regular staff appraisals	14	70%	15	94%	10	100%	39	85%
We offer ongoing training and development	15	75%	15	94%	10	100%	40	87%
We conduct staff satisfaction surveys	7	35%	9	56%	7	70%	23	50%
We offer staff benefits packages	2	10%	8	50%	7	70%	17	37%
We offer flexible working hours	15	75%	10	63%	9	90%	34	74%
We have staff incentive schemes	6	30%	8	50%	7	70%	21	46%
We give staff opportunities to work in our overseas office	2	10%	5	31%	10	100%	17	37%
We recognise high achievers	4	20%	8	50%	9	90%	21	46%
other	0	0%	2	13%	1	10%	3	7%

Question 19: What percentage of total operating turnover are you using to fund training and professional development?

	%
Small	3.8%
Medium	5.5%
Large	2.1%
Total	3.8%

Question 20: How many engineers have been employed by your firm in the following time frame?

	Small	Medium	Large
	Count	Count	Count
0-12 months	2	17	160
12 months - 2 years	1.35	12	180
2 - 5 years	1.55	13	323
5-10 years	1.25	9	83
10 + years	1.25	6	33
Average 10 years	1.46	11.41	155.64

Question 21: What percentage of your firm's male and female employees fall into the following categories?

	Small	Medium	Large		Small	Medium	Large
	%	%	%		%	%	%
Male Entry	45	58	61	Female Entry	14	23	32
Male Mid level	45	66	66	Female Mid	11	12	20
Male Senior	50	65	74	Female Senior	29	10	10
Male Principals	53	65	76	Female Principals	25	9	5

Question 22: Can you suggest what should happen in the following areas to improve the number of available GRADUATES/ENTRY LEVEL engineers?

The Government (in order of priority)

- Improve the image of engineering as a rewarding career;
- Put a stronger emphasis on maths and science subjects in schools;
- Increase the education budget for engineering;
- Introduce tax incentives for engineering professionals;
- Introduce a trainee scheme;
- increase salaries for math and science teachers;
- Increased funding to universities;
- Reduce HECS Fees.

Schools (in order of priority)

- Raise the profile of engineering as a rewarding career;
- Promote maths and science education in schools;
- Increase the involvement of engineering institutions and industry representatives in career days;
- More hands on Lego and interest in making and fixing things;
- Work experiences / field trip.

Higher Education (in order of priority)

- Raise the profile of engineering as a rewarding career;
- Course content to better reflect the skills needed in the engineering industry;
- Increase number of places available and increase financing of engineering courses;
- More and better resources for teaching of physical sciences.

Vocational Education and Training (in order of priority)

- Raise the profile of engineering as a rewarding career;
- Increase cooperative programs with the industry;
- Course content to better reflect the skills needed in the engineering industry;
- Work experiences.

ACEA (in order of priority)

- Work with Government and other organisations to highlight the benefits that engineers provide to the community;
- Raise the profile and improve the image of engineering as a rewarding career;
- Work with Government and other organisations to highlight the benefits that engineers provide to the community;
- Continue to lobby for funding of university places / reduced HECS / increased funding.

Your firm (in order of priority)

- Raise the profile and improve the image of engineering as a rewarding career;
- Offer work experience to students;
- Offer traineeships and provide more opportunities for career development.

Question 23: Can you identify what should happen in the following areas to improve the RETENTION OF EXPERIENCED/MID LEVEL engineers?

The Government (in order of priority)

- Lower taxation / offer tax incentives for regional workers;
- Offer more support to firms taking on trainees;
- Increase skilled migration;
- Raise the profile of engineering as a critical profession;
- Introduce limited liability legislation in SA;
- Change laws to reduce exposure to litigation;
- Eliminate cut-out age for superannuation (now 75).



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ACEA (in order of priority)

- Raise the profile of engineering as a rewarding career;
- Discourage aggressive headhunting between firms;
- Research and advice on retention strategies for members;
- Reduce membership fees for small firms i.e. less than 5 employees;
- Promote introduction of limited liability legislation in SA;
- Regulate or monitor the recruitment agency industry.

Your firm (in order of priority)

- Motivate staff and encourage the development of skills;
- Provide staff with rewarding and challenging work;
- Pay higher salaries/offer better incentives;
- Flexible working hours;
- Better defined career paths and provide ongoing training & development.

Question 24: what is the size of your firm (total staff)?

Firm size	Count	%
1-5	11	24%
5-19	9	20%
19-50	5	11%
50-100	4	9%
100-500	7	15%
500-1000	1	2%
1000-2000	6	13%
2000-3000	1	2%
3000+	2	4%

Question 25: What % of your total staff will be retiring within 5 years or 10 years? What is the average retiring age for your firms?

	Small	Medium	Large
Average retiring age	65.6	62.9	63.66
Retiring within 5 year	17%	6.50%	6.90%
Retiring within 10 years	18%	9.80%	15.24%

Response rate

A total of 46 member firms responded to the questionnaire. The responses received represent 59% of ACEA's large firms, 25% of ACEA's medium firms and 12% of ACEA's small firms – please note that 80% of ACEA's small firms (are small partnerships where the partners themselves are often the sole staff) have a staff of less than 10 and therefore the impact of skills shortages is minimal because they are not recruiting.

End of 2008 skill survey results.