

Results of 2006 and 2007 Planning Activities

Reprint

This set of background notes was prepared to assist in various phases of the consultation process to develop Engineers Australia's new Strategic Plan 2010-2015.

RECENT PLANNING ACTIVITY

During 2006 and 2007, Council commissioned committees drawn from Congress, Council, and senior staff members to focus on various strategic planning issues. These committees consulted with eminent engineering practitioners and leaders, and our own key leadership groups, undertook literature reviews and directed a major survey with our membership.

Because each of these reviews were future-oriented, the major findings from each were summarised as Background Notes for the Strategic Planning process. They are reproduced in the following pages under the following headings. The Carrick Institute study is included as Engineers Australia was closely involved with the study into engineering education, and will take the lead role for many of its recommendations.

2020 COMMITTEE – 2006 and TASK FORCE FOR THE FUTURE – 2007

- Community expectations of engineers and engineering
- Professional development
- Support from Engineers Australia
- The practice of engineering
- Engineering Practice and CPD of the Future
- Engineering education and training – global vision
- Engineering education and training – the 'Carrick' Report, 2008

STRATEGIC MARKETING (BEATON) REVIEW – SMR 2007

- Where we are perceived to be weak or falling down
- Membership segments (using cluster analysis)
- Member needs and value propositions

August 2008

Community expectations of engineers and engineering	
The '2020 View'	Issues for the Future
<p>The community will expect engineers to deliver a higher quality of life and will have a low tolerance of failure.</p> <p>To preserve community interests, engineers will need to be involved proactively in communication/decision-making processes.</p> <p>Engineers Australia should work more closely with other non-engineering professional bodies and seek more direct involvement in key advisory bodies.</p>	<p>EA needs to engage in debate on significant social, ethical and technical issues eg infrastructure, sustainability, water resources, energy sources, and on the risks from the engineering skills shortage and from reliance on integrating migrant engineers.</p> <p>Need to inform society on the capability and community focus of engineers to make them aware of what they can correctly expect from engineers.</p> <p>Reinforce and promote Chartered Status as the badge of competence.</p> <p>Put in place and promote an appropriate national registration scheme for engineers.</p>
Professional development	
<p>Engineers will require the necessary skills to work in a multi-disciplinary environment.</p> <p>The delivery of engineering education will need to change to incorporate more ethical/legal training.</p> <p>Focus on the 'softer' skills.</p> <p>Cultural skills for global mobility.</p> <p>Emphasis on sustainability.</p>	<p>Continued support for Chartered Status and expansion of the PDP.</p> <p>Work with industry to ensure the right focus on skills development, challenging responsibilities, career development, and recognition and reward for demonstrated professional competence.</p> <p>Support for cadetships and scholarships?</p>
Support from Engineers Australia	
<p>Flexible delivery of CPD, services and support. More electronic means, accessible to members in their own time frame anywhere in the world.</p> <p>CPD in broader softer skills need to be accessible.</p> <p>Support for older members.</p> <p>General increase in communications between the organization and members.</p> <p>Services and support to reflect industry needs.</p> <p>The ability to export/import a knowledge base – needs to be two-way to continually expand that body of knowledge.</p> <p>A more structured approach to claiming CPD (incorporating compulsory components) to ensure better engineers.</p> <p>Provide a career/job support role - career advice and planning.</p> <p>Continual communication and dialogue with members of what EA offers (not only the tangible benefits) - not simply at the recruitment stage.</p>	<p>Refine our communications and ensure that our membership is engaged – particularly our younger members.</p> <p>Articulate our benefits and values clearly.</p> <p>Provide 'whole of career' support for members. CELM is very important in this.</p> <p>Expand our support for career planning and mentoring.</p> <p>To what extent does Engineers Australia see itself as a source of technical excellence and expertise for members?</p> <p>Work with other professional bodies to provide better coordinated cross-discipline CPD for members.</p> <p>Consider carefully how widely EA can maintain focus on key priorities for the profession.</p>

The practice of engineering	
The '2020 View'	Issues for the Future
<p>Engineering will be practiced in a multi-disciplinary environment.</p> <p>New engineering opportunities will proliferate at the intersect between disciplines; 'disruptive technologies' with the potential to change the face of engineering will emerge; meanwhile, the importance of existing disciplines will not decline.</p> <p>Engineers will be more accountable for the entire footprint of a project not simply the purely technical aspects. There will be social, environmental and OHS responsibilities.</p> <p>A true focus on sustainable solutions (which may not always be engineering ones).</p> <p>ICT advances will provide flexible working environments which will enable a better working/personal life balance with a move away from rigid working hours and location.</p> <p>Organisations such as Engineers Without Borders will have increased relevance as engineers will be involved in bringing developing countries out of poverty to make them a resource rather than a liability.</p> <p>Better links between Governments, industry and academia to define supply and skills requirements for engineers. Education recognised as an investment, not a cost.</p> <p>Globalisation will change the role of engineers in a 'borderless' environment. Much straight technical work will be out-sourced offshore.</p> <p>Increasing urbanisation across the globe will raise demand in the services sector.</p> <p>Australian engineers will focus on 'full service' concept development, systems solutions, project management, and quality control.</p> <p>Young engineers will be more globally mobile in pursuing their careers and further education.</p> <p>Older engineers will remain in the workforce as the population ages.</p> <p>Women are properly represented in the engineering workforce and see engineering as a fulfilling, lifelong career.</p>	<p>Work closely with Governments, industry and academia to define requirements for the number, training, competencies and classification of engineers. Facilitate the achievement of those requirements.</p> <p>Flexibility in College and Technical Society structures to support new engineering disciplines; and to cope with change in the way existing disciplines are practised.</p> <p>EA needs to be an overt voice on sustainability.</p> <p>Support workplace flexibility and cultural change to ensure a diverse, democratic and inclusive engineering population.</p> <p>Address the 'informed customer' issue with Governments and companies.</p> <p>Maintain and strengthen Washington, Sydney and Dublin accord involvement to facilitate mobility for EA members.</p> <p>Facilitate mobility through MRAs, Engineers Mobility Forum, APEC Engineer.</p> <p>Address the 'Bologna question'. Traditional or '3+2' education?</p> <p>Define the role of Australian engineers in a global market. What is the 'Brand Image' of Australian engineering?</p> <p>Enthuse school students that engineering is an exciting career choice. Maintain and expand EngQuest and the Science and Engineering Challenge. Consider ways to better prepare candidates for engineering studies.</p> <p>Work cooperatively with the Science community on common issues of career attraction and recruitment. Create acceptance for a National Science and Engineering Week.</p>

Engineering Practice and CPD of the Future

2007 Task Force

Analysis of the growing risk, legal and regulatory environments in which Engineers, Technologist and Associates now practice will have impacts on the topics for CPD delivery with a need to provide members of the engineering team with skills in these areas along with continued development in the core technical areas. The growing legal and risk environment will push for greater emphasis on monitoring of the quality of CPD provided to ensure the upholding of professional standards that will stand against litigation.

It will be important for Engineers Australia to consider the outcomes of the review of Engineering Education by the Australian Council of Engineering Deans in terms of its implications for future CPD topics and delivery. If significant changes are made via the review to the structure of courses and hence the teaching of basic engineering knowledge to students, the graduates of the future may require different CPD needs than current graduates to ensure the upkeep of the standard of the engineering profession in Australia.

The review of areas of practice undertaken by the Task Force shows a trend towards members of the engineering team practising in a wide variety of areas and often across a number of areas. The implications for Engineers Australia's CPD delivery are for greater emphasis on joint discipline activities and for CPD delivery in a more diverse, yet specialised range of topics.

It will be increasingly important to produce engineering team members who are leaders able to create a strategic vision. These people will form innovative partnerships dedicated to raising people's standards of living and solving the world's engineering and technological problems. More women, minority groups and older members of the engineering team will have to be attracted and supported by the engineering profession to meet these challenges. Engineering team members will need to be involved proactively in providing leadership and guidance to determine public policy and to define the research agenda on emerging technologies. They will be fundamental to providing the maintenance of physical and social infrastructure, and developing new products and services. Engineering team members will need to adopt the skills that allow them to operate effectively internationally in the areas of engineering teaching and practice and in the prescription of codes, standards, regulations and ethical practice.

There will be a continued need for a variety of CPD delivery methods to satisfy an increasingly diverse profession, yet highly specialised groups of professionals. The trend towards electronic communication and delivery will continue to grow. This form of delivery will have increasing importance for time constrained engineering team members. Engineers Australia will have to focus on, and invest in the different forms of electronic delivery in order to ensure provision of CPD to all its members. However, face-to-face or hands-on learning and CPD will still retain a level of importance due to the effectiveness of the medium and the member's desires to build networks.

Engineers Australia will have to consider qualitative methods of reporting on its CPD. At present the bias in reporting is on quantitative measures such as number of hours provided or number of attendees. However mechanisms will need to be considered by the Colleges, Societies and the Engineers Australia organisation as a whole in looking at the quality of CPD provided and the value of the learning gained from that CPD. The emerging environment of risk management and a greater emphasis on ethics in practice means reporting of CPD in quantitative form only will not enable analysis of whether Engineers Australia's CPD is helping engineering team members contribute effectively and appropriately to society.

Engineering education and training – global vision

2020 Committee

The Engineering Team is defined by attributes at all career stages, with a concentration on the outputs delivered by education and training and with members required to achieve experience which is audited and certified, i.e. its abilities are directed at achieving outcomes in a changing world with flexibility.

Training is multi-disciplined and facilitates working in multi-disciplined teams, mixing engineering and other skills, with considerable emphasis on skills to deliver economically-justified socially-responsible solutions.

The major stakeholders have acknowledged and apportioned appropriately the costs of education and training, understanding the role of the profession itself as a gatekeeper and facilitator of education and training, recognising the profession's underlying reliance on members' funds (i.e. engineers are paying a large part of the cost of specifying what engineering is and in defining competencies and standards for accreditation).

Government facilitates skills and numbers required by the economy and the market place, legislates for accreditation and protects Engineer and other category titles, works with the profession on education and training and regulation and also works with the profession (as it does with NGOs) on policy issues.

Industry assesses its needs and numbers of engineers with government and universities, works with government, universities and the profession to ensure appropriate standards, recognition and funding and brokers "in-house" and "on site" education and training.

Co-regulation and self-regulation continue to exist side by side, but are widely understood.

Global regulation and mobility are based on distributed registers and a cooperative approach among stakeholders.

Education and training providers operate globally subject to national regulation with "just in time" education and training programs. Technology is able to facilitate education and training and participation in practice across boundaries.

Single and multi-discipline international societies cooperate and share knowledge. National societies work with governments and participate in international accords.

International representative engineering organisations bridge the gap between the United Nations and the engineering community; facilitate exchanges in the profession between developed and emerging economies and foster good engineering standards and ethical practice.

Engineering education and training – ‘Carrick Report’, 2008	
Addressing the Supply and Quality of Engineering Graduates for the New Century	
<p>Undertaken at a time of high demand for engineers, the project identified critical issues such as the continuing reduction in the size of the pool of Australian school students studying the requisite high levels of mathematics and science, and the low participation of women in university engineering programs.</p> <p>The study reports concerns about the educational capacity and robustness of the engineering education system to graduate increased numbers of engineers with the qualities required.</p> <p>The recommendations aim to ensure that the system can meet society’s future needs for engineers – they are intended to be a roadmap for the next decade of development of Australia’s engineering education system.</p> <p>An Implementation Team has been established under a standing Tripartite Agreement among Engineers Australia, the Australian Council of Engineering Deans (ACED), and the Academy of Technological Sciences and Engineering (ATSE), to champion and provide strategic leadership of the implementation of the report’s recommendations.</p> <p>Each recommendation has identified ‘responsible organisations’, ‘other stakeholder organisations’ and ‘measures and milestones’ that may be used over time to track the success of the proposed actions. Most recently, ACED has been requested to submit a proposal to Australia Learning and Teaching Council (formerly Carrick Institute) for funding of work on “Curriculum Standards and Frameworks”.</p>	
Engineers Australia will be responsible for taking the lead role for many of the actions identified against the six overarching recommendations.	
Recommendation 1 the public perception of engineering	Raise the public perception of engineering, including within primary and secondary schools, by increasing the visibility of the innovative and creative nature of engineering and the range of engineering occupations that contribute to Australia’s prosperity, security, health and environment.
Recommendation 2 the engineering occupational levels and graduate outcome standards	Develop, support and promote the concept, reality and importance of all members of the engineering team – Professional Engineers, Engineering Technologists and Engineering Officers – in the successful implementation of engineering work. Review the graduate competencies and reference standards for the qualifications for each level.
Recommendation 3 implementing best-practice engineering education	Engineering schools must develop best-practice engineering education, promote student learning and deliver intended graduate outcomes. Curriculum will be based on sound pedagogy, embrace concepts of inclusivity and be adaptable to new technologies and inter-disciplinary areas.
Recommendation 4 resources for engineering education	Enhance staff and material resources to enable delivery of engineering education that is demonstrably aligned with Australia’s needs and compliant with international standards.
Recommendation 5 engagement with industry	Engineering educators and industry practitioners must engage more intensively to strengthen the authenticity of engineering students’ education.

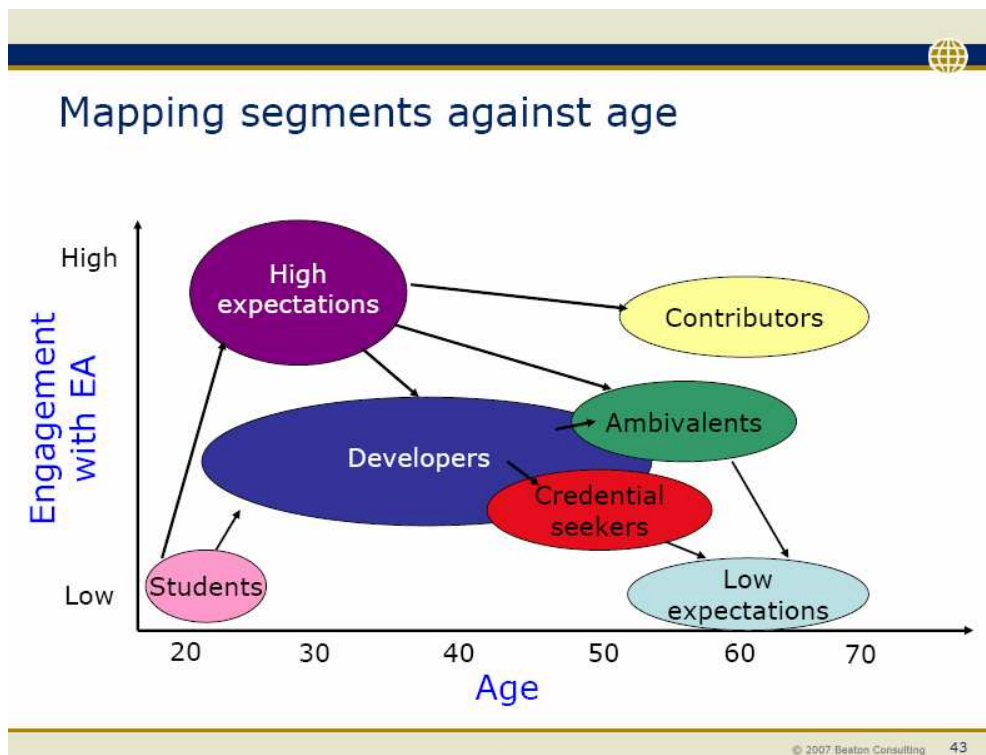
<p>Recommendation 6 address shortages by increasing diversity in engineering workplaces supported by engineering education programs</p>	<p>Address shortages in the engineering workforce by attracting and retraining people from non-traditional backgrounds e.g. women, mature age engineers, engineers with overseas qualifications, engineers who have left the profession, and engineers wishing to articulate between qualification levels.</p> <p>Ensure the future needs of employers are matched by the number and types of programs on offer.</p>
--	--

SMR 2007 (BEATON) – Where we are perceived to be weak or falling down

1. **We are not building a positive community opinion of engineering as a profession**
 - Low perceived importance of engineers compared to other professional areas – eg. medicine, architecture
 - Low recognition for engineering achievements
 - Achievements not promoted to the wider community
2. **We are not taking a leadership role to advocate for the profession**
 - Lacking a ‘voice’ and profile in government and in the media
 - Lacking influence at the political level
 - Not debating ‘hot issues’ in the media – eg. climate change, nuclear power
 - Not enough input into policy
3. **Poor community knowledge – lack of a clear definition – of what an engineer is**
 - Often confused with lower-skilled technical jobs or trades
 - “Train drivers are engineers. How does that make my 5 year degree important?”
4. **Lack of promotion of engineering as a good career choice**
 - Especially to schools
5. **Chartered Status lacks market clout**
 - Benefits of doing the program are unclear or not believed to deliver sufficient value
 - Difficult to ‘sell self’ against criteria
 - Not well recognised by employers; not financially rewarded
 - ‘Hit and miss’ in terms of who supports it
 - Some believe it should have the status of CPA
6. **Not managing membership needs for a fragmented profession**
 - Trying to be ‘too many things to too many people’ thus diluting the value of membership
 - More ‘niche’ professional areas not well served
 - Not universal in its representation of the profession
 - Not utilising ‘knowledge bank’ of those in niche professions or technical areas
 - Access issues for members who are not close to activities venues
7. **Not enough focus on leadership in technical development of the profession:**
 - Training, especially for young engineers
 - Development, especially with universities on course curriculum
8. **Not communicating the value of membership**
 - Benefits in return for fees paid
 - For some, perceived value is what they get from the EA magazine

9.	Technologists and associates as members are 'second rate citizens'
10.	Student members do not feel engaged
11.	Not addressing the needs of women engineers to help improve the attractiveness of the profession

SMR 2007 (BEATON) – Membership segments (using cluster analysis)



High Expectations – 27%

Membership attitude: 'Give me everything, starting with recognition'

Consider all member benefits important (highest importance ratings compared to other segments).

Place higher importance on professional recognition post-nominals and industry information.

Heavy users of EA's member services and most likely to use O/S qualification and the member benefits program.

33% hold Chartered status – 17% currently completing.

Show strongest concern for EA's future focus – to be developing and improving PDP and Chartered status, taking a more active role in the media, strengthening influence over technical governance, a TV campaign showcasing the profession, and educating the membership of existing benefits.

They rate EA's performance the highest, have the highest propensity to recommend EA, and the highest likelihood to renew their membership.

Developers – 26%**Membership attitude: ‘Develop my career capability’**

Consider most member benefits important.

Professional recognition through the PDP, Chartered status and technical expertise are the primary benefits.

The primary member services used are Chartered status, the PDP, technical colleges and societies and special interest groups.

36% hold Chartered status – 18% currently completing.

More than other segments, want EA’s future focus to be developing and improving the PDP and Chartered status, and educating the membership of existing benefits.

They rate EA’s performance above average, with an average propensity to recommend EA, and their likelihood to renew their membership is also average.

Contributors – 11%**Membership attitude: ‘Involve me in your initiatives’**

Consider specific member benefits important.

Place higher importance on making a contribution to the advancement of the profession, as well as their own professional development and recognition.

Heaviest users across the range of member services.

71% hold Chartered status – 4% currently completing .

Show strong concern for EA’s future focus – more than other segments want EA’s future focus to be on educating the community about what engineering is, taking a more active role with the media, visiting schools to talk about careers, strengthening influence over technical governance and a TV campaign showcasing the profession.

They rate EA’s performance above average, have the highest propensity to recommend EA, and have the highest likelihood to renew their membership.

Ambivalents – 11%**Membership attitude: ‘What’s in it for me now?’**

Regard most member benefits of average importance.

The primary benefit is seen as contributing to the advancement of the profession and growth of the profession.

Lower experience with Chartered status and PDP vs other segments but these are the main member services used.

38% hold Chartered status – 7% currently completing.

More than other segments want EA’s future focus to be the promotion of engineering careers through schools, and working with universities on course curricula.

They rate EA’s performance below average, their propensity to recommend EA is below average, and their likelihood to renew their membership is the lowest.

Credential Seekers – 11%**Membership attitude: 'Grow my status and technical knowledge'**

Consider specific member benefits important.

Consider professional recognition and access to technical information the primary benefits.

Chartered status, the PDP, technical colleges and societies are the main members services used.

37% hold Chartered status – 8% currently completing.

More than other segments want EA's future focus to be taking a more active role in the media.

Their satisfaction level is below average for EA's performance, propensity to recommend, and likelihood to renew.

Low Expectations – 6%**Membership attitude: 'I'm in it to be recognised'**

Consider all member benefits unimportant, with the lowest importance ratings.

The most important benefit of membership is instant recognition as a 'stamp of quality' in the engineering profession.

Chartered status, the PDP, technical colleges and societies and special interest groups are the primary member services used.

46% hold Chartered status – 4% currently completing.

Show least concern for EA's future focus.

Rate EA's performance the lowest, have the lowest propensity to recommend EA, and their likelihood to renew their membership is below average.

SMR 2007 – Six distinct member needs from Engineers Australia
To contribute, I want ...
<p>Support to educate the greater community about the engineers' valuable contribution.</p> <p>Support to help grow interest for careers in engineering.</p> <p>Support to influence policy, legislation and the media to protect and grow the profession.</p> <p>To contribute to advancing the profession through special interest groups, societies, etc.</p> <p>Forums to express views on issues facing the industry and discuss solutions and ideas.</p> <p>Opportunities to give career advice and guidance.</p>
<p>Value proposition: Be part of an association that promotes the engineering profession</p> <p style="text-align: center;">Make a worthwhile contribution to the profession</p>
For Networking, I want ...
<p>Business networking events, functions and conferences.</p> <p>Opportunities to meet influential people.</p> <p>Events and functions for specific interest groups, professions or technical areas.</p> <p>Opportunities to develop business partnerships or find employees.</p> <p>Collegiate membership body / sense of belonging.</p> <p>Social events and functions.</p> <p>Information and advice about jobs overseas.</p> <p>Information and advice about careers in industry.</p> <p>A mentoring program.</p> <p>Information about 'people moves' in industry.</p> <p>Office-bearer or leadership roles in membership groups.</p>
<p>Value proposition: Develop business and social networks across industry and the profession</p>
For Personal Development, I want ...
<p>Training to improve writing and communication skills.</p> <p>Training to learn people or office management skills.</p> <p>Information and advice on managing a business.</p> <p>Ability to take a career break and suspend PDPs or credentials.</p> <p>Technology that enables viewing of meetings or training sessions remotely.</p> <p>Member benefits with business partners.</p>
<p>Value proposition: Develop management and communication skills</p> <p style="text-align: center;">Obtain career support to grow career options</p>

For Information, I want ...
<p>Technical engineering information.</p> <p>Up-to-date information on issues impacting engineers and the profession.</p> <p>Access to industry information on major projects, legislation and policy.</p> <p>General information to improve understanding of the Australian engineering profession.</p> <p>My technical or professional area represented as a group in the membership.</p>
<p>Value proposition: Keep up to date with technical developments and industry news</p> <p style="text-align: center;">Access a broad range of engineering information</p>
For Status (Professional Recognition), I want ...
<p>Professional recognition through the award of Chartered status.</p> <p>A recognised PDP that develops skills with employers and can lead to Chartered status.</p> <p>CPD after the award of Chartered status.</p> <p>Membership that gives instant recognition as a stamp of quality among the engineering community.</p>
<p>Value proposition: Obtain and maintain valuable credentials</p> <p style="text-align: center;">Be recognized for developing and maintaining technical skills</p>
For Compliance, I want ...
<p>Membership because it's a job pre-requisite.</p> <p>Membership highly valued by my clients.</p> <p>Membership highly valued by my employer.</p> <p>Membership that recognises me as a professional in my area.</p>