

THE ELECTRIC POWER ENGINEERING CENTRE
'Power Engineering as a Field of Excellence in New Zealand'

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ABSTRACT

The Electric Power Engineering Centre (EPECentre) was launched in 2002 and is governed by a trust board, the Power Engineering Excellence Trust, representative of the New Zealand power industry. It was established in response to a growing industry shortage of qualified electric power engineers, and to plan for and administer the critical issues facing New Zealand's electric power industry. Its purpose is to promote and support the education of power engineers and the study of power engineering as a field of excellence in New Zealand. It is focussed on bringing fresh minds and perspectives to New Zealand power engineering through student-industry interaction, enabling awareness of and planning for future industry challenges. It will be working to encourage greater numbers of students into power engineering courses at Canterbury University, to establish stronger relationships between students and the industry, to increase the quality and quantity of power engineers in New Zealand, and to create and foster power engineering innovation and research. To reach the long-term objectives of the EPECentre, all operational requirements have been identified and a business plan developed, along with a host of programmes, activities, and initiatives. Thus far, a large percentage of these have been implemented including various field trips, scholarships, conferences, conventions, market research, work placement in the power industry for engineering students, etc., which have resulted in increased student enrolments in power engineering courses, and a renewed interest in power engineering research at Canterbury University.

1. INTRODUCTION

The Electric Power Engineering Centre (EPECentre) is a centre for excellence and research in electric power engineering based at the University of Canterbury, in Christchurch. The EPECentre was officially launched on June 21st 2002, at the annual Electricity Engineers' Association (EEA) Conference, in response to a growing industry shortage of qualified electric power engineers in New Zealand, and to plan for and administer critical issues facing New Zealand's electric power industry. Thus, the sole purpose of the EPECentre is to promote and support the education of power engineers, and the study of electric power engineering as a field of excellence in New Zealand.

The EPECentre is focussed on bringing fresh minds and perspectives to New Zealand power engineering through student-industry interaction, enabling awareness of and planning for future industry challenges. It is working towards encouraging greater numbers of students' into power engineering courses at the University of Canterbury (which was in decline for the past few years), to establish stronger relationships between students' and industry, to increase the quality and quantity of power engineers in New Zealand, and to create and foster power engineering innovation and research.

The EPECentre is funded by the power engineering industry, and administered by a trust board, the Power Engineering Excellence Trust (PEET), whose on going role is to secure continued funding for the EPECentre.

Membership of PEET (gained through pledges of funding) is representative of both the industry and the University of Canterbury under the chairmanship of Dr Keith Turner, Chief Executive of Meridian Energy, and the guidance of Prof. Pat Bodger, Director of the EPECentre, who is also a Professor of Electric Power Engineering and Head of Department in the Department of Electrical & Computer Engineering, University of Canterbury.

To achieve its goals, the EPECentre employs a full time Co-ordinator/Manager and currently offers a number of support programmes and initiatives in a variety of areas, including student scholarships,

practical work placement, graduate recruitment, research, field trips, mentoring, and extramural training. [2]

Founding supporters of the EPECentre are: ABB, Alstom, Beca Carter Hollings and Ferner, Contact Energy, EEA, Electrix, ENA (Electricity Networks Association), Genesis, Mainpower, Marlborough Lines, Maunsell, Meridian Energy, Mighty River Power, MWH, Orion, Powerco, Transpower, United Networks, WEL Networks, and the University of Canterbury.

2. EPECENTRE PROGRAMMES AND INITIATIVES

The EPECentre operates under the guidance of an evolving strategic plan, which incorporates a marketing plan that targets Electrical Engineering students' at Canterbury University. These plans are the foundation for implementing annual EPECentre programmes and initiatives.

There are well over a dozen annual EPECentre events and programmes initiated each academic year. These can range from presentations to students' at the beginning of each year, to facilitating industry presentations, scholarship awards for students specialising in electric power engineering, student field trips to New Zealand North and South Island power engineering industry sites, joint industry conventions, hosting conferences, open days, student surveys, research activities, and an extremely effective student work placement/graduate recruitment database.

3. ACHIEVEMENTS TO DATE

The EPECentre has achieved a number of successes, largely due to its understanding and analysis of its target markets 'academia' and 'industry'. The programmes and activities initiated by the EPECentre are based on these findings, and the resulting 'achievements' outlined below are evident of this understanding, where expectations and needs of both academia and industry have been identified and targeted i.e. the key to success in establishing 'power engineering as a field of excellence in New Zealand'.

3.1 EPEC Convention

The first official event organised by the EPECentre was the EPEC Convention in 2002, which attracted over 150 electrical engineering students. This was a record turnout for an event of its kind in the history of the School of Engineering at Canterbury University. The purpose of the convention was to provide an opportunity for industry members to inspire and encourage students to study or work in electric power engineering, and it has now become an annual event in the EPECentre calendar.

3.2 Work Placement/Graduate Recruitment

The EPECentre has initiated a student work placement/graduate recruitment database, containing over 100 student registrations. This database has facilitated student/graduate employment within the power industry for well over 60 students since its inception in November 2003.

Consequently, this service has provided many benefits to industry organisations associated with the EPECentre, because of significant advantages over traditional methods of recruitment, in terms of cost efficiency and ease of use i.e. there are no intermediaries (all candidates are short-listed by the EPECentre) and cost savings on recruitment consultant fees and advertising (approximately NZ\$5,000-\$7,500 worth of savings for every permanent vacancy filled by the EPECentre (source: Ryan Recruitment Ltd. NZ)). This database has been extremely effective to the extent that as a result, various recruitment agencies have been in contact with the EPECentre to 'assist' them with technical recruitment.

3.3 EPECentre Scholarships

The EPECentre has introduced 10 undergraduate and 2 postgraduate scholarships each year for students specialising in electric power engineering. Since 2003, over 20 undergraduate scholarships (valued at \$5,000 each) have been awarded, and each of the successful candidates have reached high standards of academic excellence (all received B or A average grades for their courses). Note: there is incredible interest and competition among students to receive these scholarships.

3.4 Field Trips

In August 2003, almost 40 electrical engineering students took part in a highly successful field trip, to visit electric power engineering industry sites in the North Island of New Zealand. This was a 'first' for any University of Canterbury organised field trip (and quite possibly for any educational field trip conducted in New Zealand), because it involved a mix of air and land transportation for a large group of students.

The field trip was initiated, co-ordinated, and fully funded by the EPECentre, and was the highlight of the annual calendar. Those that took part described it as being 'thoroughly enjoyable and educational'.

Previous field trips had been operated by the University of Canterbury's Electrical & Computer Engineering Department, with an itinerary focused on the South Island. However, based on EPECentre survey results, and positive student feedback, the EPECentre will host two field trips in 2004, one to power industry sites in the South Island, and the other to industry sites in the North Island.

3.5 Sponsorship

The EPECentre has become a major supporter of electric power engineering related events and activities. In 2003, the EPECentre was the principal sponsor of the Australasian Universities Power Engineering Conference (AUPEC03) held in Christchurch; the theme of the conference was 'distributed generation'.

The EPECentre will also be a major sponsor for the IEE Young Members Section 'Short Paper Evening 2004'. This event is aimed at introducing the future engineers' of tomorrow into the realm of public speaking and technical presentation of research material to large audiences. Based on its success, this event is set to become a nationwide or international event.

3.6 Student Interest and Perception of Electric Power Engineering

Since the introduction of the EPECentre there has been a significant, positive change in student interest towards the field of electric power engineering. According to EPECentre survey results, students at Canterbury University have become more aware of electric power engineering academia/industry, its opportunities, and employability for graduates specialising in electric power engineering (*figure 1 and 2 depicts changes in student interest between 2002 and 2003 - according to these graphs, student interest in power is the only field that has increased in interest in 2003, interest in all other fields have decreased. However, power is still at the 'low end' of the scale and there is significant room for improvement over the next few years, with the help of the EPECentre*).

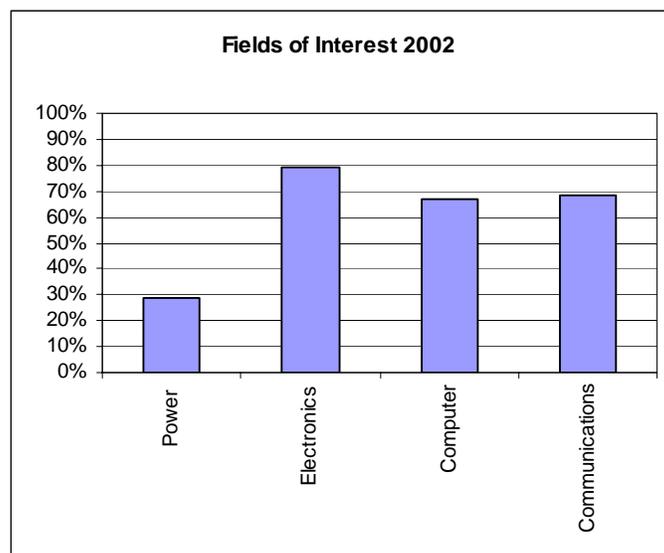


Figure 1. *First Professional year electrical engineering student interest in 2002 (prior to EPECentre establishment)[1]*

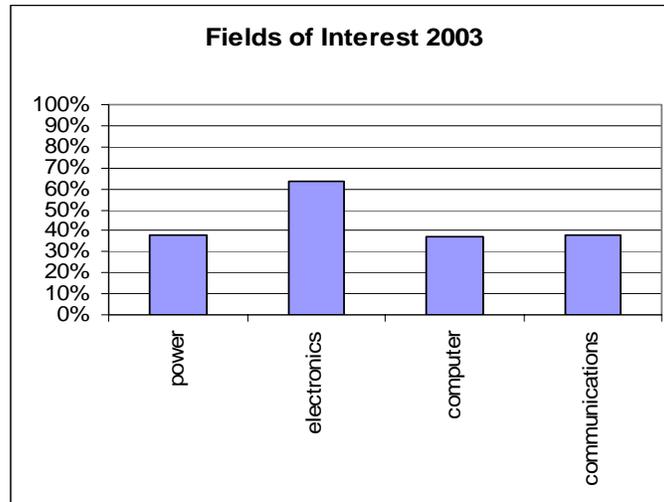


Figure 2. *First Professional year electrical engineering student interest in 2003*

Further research indicates that student perception of electric power engineering has changed in the following areas, employment opportunity, and technical difficulty in understanding i.e. perception of challenge (see figures 3 and below for a comparison between 2002 and 2003).

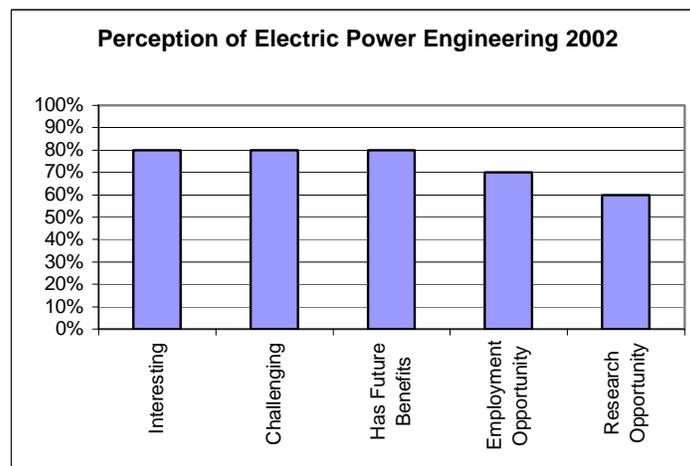


Figure 3. *First Professional Year Electrical Engineering Student perception of electric power engineering in 2002 [1]*

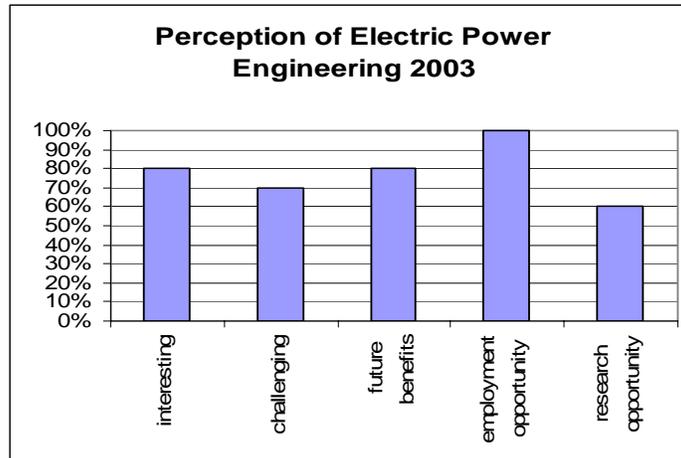


Figure 4. First Professional Year Electrical Engineering Student perception of electric power engineering in 2003 (note: change in student perception for employment opportunity and challenge or technical difficulty)

3.7 Enrolments in Electric Power Engineering Courses

Student enrolments in electric power engineering courses at the University of Canterbury have increased dramatically since the launch of the EPECentre in 2002. This is evident in student enrolment numbers from 2003 and 2004 (see figure 5), which can be attributed to the successful implementation of EPECentre initiatives and programmes.

Second Professional Year Electrical & Computer Engineering

Electric Power Engineering course enrolment changes:

2003 - 14% increase from 2002

2004 - 18% increase from 2002

Third Professional Year Electrical & Computer Engineering

Power Systems course enrolment changes:

2003 - 8% increase from 2002

2004 - 12% increase from 2002

Power Engineering Applications course enrolments:

2003 - 3% increase from 2002

2004 - 10% increase from 2002

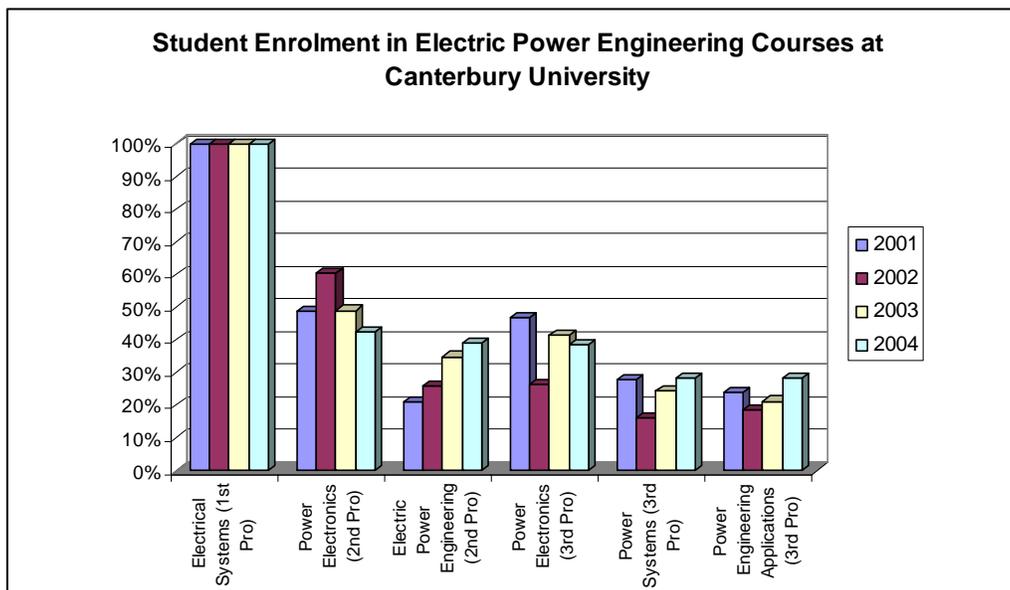


Figure 5. Enrolments in power engineering courses at Canterbury University 2001-2004

4. FUTURE OPPORTUNITIES

The EPECentre has many opportunities and challenges ahead, to achieve its long-term objective of establishing 'power engineering as a field of excellence in New Zealand'; some areas of opportunity include:

- EPECentre research projects
- Promotion of electrical engineering as a future career for high school students nationwide
- Facilitate professional short courses in areas of power engineering
- Future support of national and international power engineering conferences and events
- Joint initiatives and collaborative projects with industry sponsors
- Promotion of power engineering to secondary school students/teachers
- Increasing the awareness/informing the general public on the engineering behind electricity supply

"The EPECentre requires the continued support of industry partners to continue and meet these goals, and to foster and develop electric power engineering excellence in New Zealand."

5. CONCLUSION

The Electric Power Engineering Centre was established in response to a growing shortage of qualified power engineers in New Zealand, and its sole purpose is to promote and support the education of power engineers, and the study of power engineering as a field of excellence in New Zealand.

The centre is fully funded by the power industry, and is governed by the Power Engineering Excellence Trust (PEET) under the chairmanship of Dr. Keith Turner, Chief Executive of Meridian Energy, and under the guidance of Prof. Pat Bodger, Director of the EPECentre and Professor of Electric Power engineering, University of Canterbury. The programmes or events organised by the EPECentre are primarily aimed at students studying engineering at the University of Canterbury who may be interested in a career in power engineering. Some initiatives to support this include introductory presentations, EPEC Convention, Prestige Lecture Series, student scholarships, student surveys, EPECentre bulletins, and a student practical work experience/graduate placement programme.

In conclusion, a solid foundation for the Electric Power Engineering Centre has been set, and the achievements to date, such as the successful EPEC Convention, field trips, student work placement, and the awarding of EPECentre Scholarships has resulted in increasing student enrolment in electric power engineering courses, at the University of Canterbury by much as 3%-14% in 2003, and 10%-18% in 2004 compared with 2002, prior to the launch of the EPECentre.

This indicates that the EPECentre is making significant progress towards achieving its long-term strategic goals and objectives, with the key being its understanding and insight into academia and industry. As a result, the EPECentre requires the continued support of the power industry, to continue with the implementation of its proposed programmes and activities, to maintain the quality of programmes/initiatives offered, and to accomplish its long-term objectives - '*power engineering as a field of excellence in New Zealand*'.

6. REFERENCES

[1] Lawrence, J.D. "Electric Power Engineering Centre – Strategic Business Plan", University of Canterbury, Christchurch, New Zealand, 2002.

[2] Website: www.epecentre.ac.nz