



POWER  
ENGINEERING EXCELLENCE  
TRUST

# Annual Report 2012



# Chairmans Statement

This year has been a rewarding year for the Power Engineering Excellence Trust (PEET) and Electric Power Engineering Centre (EPECentre).

In 2011 the EPECentre Board and PEET reported that a key focus area for 2012 would be developing the Centre's research capability to support and increase industry research opportunities and student numbers.

The Centre in partnership with industry, the University of Canterbury and PEET submitted a research project proposal to Government in early in 2012. In August, the Government announced the bid had been successful and a total grant of \$6.3 million had been agreed for a six year project on "Renewable Energy and the Smart Grid – Future Proofing New Zealand's Electricity Supply" (the project is referred to as GREEN Grid). The awarding of the grant has confirmed EPECentre is a leading international research centre of excellence and has created new opportunities going forward to attract world class researchers, raise the profile of power engineering and attract new students and lecturers to the University of Canterbury. As well, the project will lead to new learning opportunities for our students studying Power Engineering and provide to our industry members insights and understanding of the 'GREEN grid' technology and its implications.

This project is being led by Dr Allan Miller, Director of the EPECentre, who is developing a strong team of international and local researchers, power engineering students and key industry engineers to support the project.

In 2002 it was recognised by industry leaders that graduates in power engineering had been in decline since 1990, and without intervention and support from our industry our skill gap in power system engineering would be significant.

Our challenge then was twofold;

1. To maintain the viability of electric power engineering education in New Zealand; and
2. To maintain the supply of electric power engineering graduates going into industry.

Those challenges still remain in 2012 and have been further exacerbated by the Canterbury Earthquakes.

With your support since 2002, we have managed to lift the number of graduates. These graduates are now out in industry and making an impact. I regularly come across them when visiting different industry companies. The graduates are extremely appreciative of the opportunities PEET, EPECentre and industry have given them. They are our ambassadors and the best examples of why the work of PEET/EPECentre is so important and needs to be sustained.

Looking forward, are graduate numbers enough going forward? Globally and within NZ there is a shortage of engineering skills and growing concerns at the reducing numbers of students taking math and science subjects that enable them to enter engineering training.

The University Of Canterbury is now in recovery mode with new buildings planned and student numbers growing. Your on-going support of PEET and EPECentre combined with the University rebuild, and opportunities from the new GREEN Grid project will allow us to maintain the gains we have achieved over the last eleven years and develop a sustainable and high quality pool of power engineering graduates for you to use in your business.

Student enrolment numbers remained constant:

- 1<sup>st</sup> Pro: Principle of Electrical Systems (54)
- 2<sup>nd</sup> Pro: Power Systems 1 (42)
- 3<sup>rd</sup> Pro: Power Systems Engineering (35)

Maintaining viable education of power engineers requires modern facilities and equipment. Canterbury University has a unique educational resource asset in the High Voltage (HV) lab. As a Board we are committed to the Lab and recognise the importance of the lab for training and research possibilities. One such example is the Research being undertaken by Dr Bill Heffernan and his team on the use of electricity to sterilise logs for export. The project has been funded by STIMBER and Primary Growth Partnership, and latterly MBIE in partnership with Scion. The research project is another example of where research and business is working together; this type of partnership leads to our students gaining excellent learning.

A key to our future growth in engineering numbers is engaging early with school students. PEET and the EPECentre has begun a pilot Canterbury project focusing on engaging with and supporting students, teachers, careers advisors and enabling them to visit and use the great facilities and meet people at the University as part of their NCEA teaching programmes. We believe this interaction will create new links into schools and encourage students to continue in sciences and math programmes; and get them "engaged" on the possibility of EPECentre/power engineering being a study and career option for them.

In 2012 the following Post Graduate theses were completed:

- Andrew Laphorn (PhD) "High temperature superconducting partial core transformers."
- Jordan Rel Orillaza (PhD) "Harmonic state space model of three phase thyristor controlled reactor."
- Rowan Sinton (PhD) "Long distance exploding wires."
- Jonathan Tse (ME) "High-Voltage signal generator for biomedical applications."
- Ryan van Herel (ME) "Wire explosion via electromagnetic induction."

Our membership base has remained constant over the ten years and we will be endeavouring to grow this and improve connection and engagement with our members. Thank you for your continued support over the years, we are seeing the value of investing in students for our industry and these young individuals are making a significant contribution to current industry work programmes.

I would like to acknowledge and congratulate Dr Allan Miller, EPECentre Director and his team for their success in securing the GREEN Grid Project. It is a great opportunity. My thanks also to my fellow Trustees and Professor Jan Evans-Freeman, Pro vice Chancellor, College of Engineering, I have appreciated their wise counsel and total commitment and support for the EPECentre and PEET.

Without the energy and enthusiasm from this dedicated team our future engineers and industry leaders would not be receiving the exceptional educational experiences that the EPECentre has delivered to date and will continue to deliver into the future.

**Peter Berry**, Chair, Power Engineering Excellence Trust/Electric Power Engineering Centre

**The trustee for 2012 were:** Peter Berry (Chair & professional engineering representative), John Foote (generation), Professor Pat Bodger (academia), Gavan Jackson (contracting), Richard Aitken (consulting), Bob Simpson (transmission), Tas Scott (distribution), Sean McCready (executive assistant to the trust), Val Lang (secretary to the trust); the PEET Trust meet four times during the year and did not receive any remuneration in capacity as Trustees.

# 2012 Highlights

## EPECCentre turns 10

The EPECCentre had a busy and productive year. A great highlight was the EPECCentre turning 10 years old. The 10<sup>th</sup> birthday celebration was held on 19 September at the EPECCentre "Power Your Future" R&D expo. At this event, Bob Simpson, Chief Engineer of Transpower talked about the importance of R&D and tertiary training for the Electric Power Engineering industry and EPECCentre Chairman Peter Berry awarded the EPECCentre scholarships. A range of post graduate and final year student projects were on display and two students received R&D awards for their projects. Professor Pat Bodger signified the event by cutting a special 10<sup>th</sup> birthday cake and R&D Expo was followed by the Careers Convention where students heard inspirational speakers from former graduates and industry representatives speaking about exciting careers.

## Scholarships

The following scholarships were awarded to students who showed strong interest and excellence in Power Engineering:

- 9 Undergraduate scholarships
- 2 Ph.D scholarships
- 2 Master of Engineering scholarships
- 2 Energise your future scholarships
- 2 Practical summer research scholarships

## Power Engineering Field Trip – South Island

The field trip tours continue to be a student favorite with 28 power engineering students visiting power generation stations, substations and switchyards and major load centers. This four day field trip included a once in a lifetime opportunity where students experienced the construction of Benmore HVDC Pole 3 project. Field trips enable students studying towards a degree in electrical engineering to realise and appreciate the scale of the industry and their own career potential in it.

## Highlighting Future Opportunities

### Practical Work & Graduate Placements

- EPECCentre "Power Your Future" careers event allowed undergraduate electrical engineering students to interact with the industry for the purpose of graduate and work placements.
- Power Industry related IEEE mock interviews were held at the EPECCentre enabling students to practice their interview skills and gain insightful feedback.

## Encouraging the next generation

### Tours and Workshops

EPECCentre led tours and workshops have proved to be popular with encouraging feedback from high school staff and students. Teachers and students from several high schools around the country with interest in physics and sciences were invited to attend special tours, workshops and demonstrations. EPECCentre led outreach events give students an insight into electrical engineering degrees and career prospects to follow.

### Outreach Videos

- 2 videos were professionally produced to showcase EPECCentre and final year engineering student projects and are viewable on the EPECCentre website.

### EPECCentre Sponsored Events

- Tv2Kidsfest (Sparcs and Arcs workshop)
- NZ International Young Physicists (NZIYPT) Tournament

## Research and development

### Publications from EPECCentre Staff

- 5 conference paper publications
- 1 magazine publication (on Health & Safety aspects of electricity smart meters)

### Research videos produced

- Log sterilization video was produced showcasing the STIMBR and Primary Growth Partnership (PGP) funded EPECCentre research that uses electricity to sterilize logs for export, and is available to view on the EPECCentre website.

### Publicity (to members)

- EPECCentre Newsletter
- New Membership information booklet with PEET membership form
- PEET membership Certificate

### Media releases

- Print release on Smart Meters and Safety, date, publication
- Radio release on Renewable Energy and the Smart Grid, 28 August, Radio NZ

**Allan Miller**  
Director of EPECCentre

# Financial Statements

## *For the year ended 31 december, 2012*

### STATEMENT OF ACCOUNTING POLICIES

#### Reporting entity

The Power Engineering Excellence Trust is a charitable trust established in 2002. The Objects of the trust are:

- encourage a greater number of students to study power engineering, thus increasing the quantity and quality of power engineers in New Zealand.
- maintain, enhance and sustain research into, and the study of, power engineering.
- create closer, stronger and synergistic relationships between students of power engineering and the power industry.
- provide for and foster power engineering innovation as a product of education.
- provide better awareness of the existence and benefits of the Department's power engineering courses to the power industry.

#### General accounting policies

The financial statements have been prepared in accordance with the Financial Reporting Standards and Statements of Standard Accounting Practice issued by the Institute of Chartered Accountants of New Zealand.

The Power Engineering Excellence Trust applies differential reporting in the preparation of these financial statements.

Full advantage has been taken of all differential reporting exemptions.

The general policies adopted in the preparation of these financial statements are the measurement and reporting of financial performance and position on an historical cost basis.

#### Particular accounting policies

The following are the particular accounting policies which have a material effect on the measurement of financial performance and the financial position.

#### Investments

All investments are stated at market value. Foreign investments have been translated to New Zealand currency at the ruling rates of exchange at balance date. Investment income is calculated as per the Statement of Investment Objectives, which is approved by University Council. This provides for a 4.5% operating return and two further distributions to equity, which maintain the purchasing power and also allow for future market fluctuations.

#### Financial instruments

Income and expenditure relating to all financial instruments are recognised in the Statement of Financial Performance. All financial instruments are recognised in the Statement of Financial Position.

#### Goods and services tax

All amounts are stated inclusive of Goods and Services Tax. As the Trust is not registered for GST, all GST is non-recoverable.

#### Taxation

The Trust is exempt from the payment of income tax as it is a not-for-profit organisation. Accordingly there is no provision for income tax.

#### Changes in accounting policies

There have been no changes in accounting policy.

## STATEMENT OF FINANCIAL PERFORMANCE

For the Year Ended 31 December 2012	Note	31-Dec-12	31-Dec-11
<b>INCOME</b>			
Sundry Income	1	335,850	204,200
Investment income / (Loss)	2	36,285	25,168
<b>TOTAL INCOME</b>		<u>372,135</u>	<u>229,368</u>
<b>EXPENDITURE</b>			
Scholarships	3	98,333	107,048
Personnel		168,155	123,360
Power Engineering Education Support		6,147	2,518
Field Trips		7,291	1,607
Consulting		31,475	-
Sundry	4	2,500	17,462
<b>TOTAL EXPENDITURE</b>		<u>313,901</u>	<u>251,995</u>
<b>NET SURPLUS / (DEFICIT)</b>		<u>58,234</u>	<u>(22,627)</u>

## STATEMENT OF MOVEMENTS IN EQUITY

For the Year Ended 31 December 2012

Balance as at 1 January		626,100	648,727
Net Surplus / (Deficit) for period		58,234	(22,627)
Other Distributions	5	31,217	-
Total Recognised Income & Expenditure		<u>89,451</u>	<u>(22,627)</u>
Balance as at 31 December		<u>715,551</u>	<u>626,100</u>

## STATEMENT OF FINANCIAL POSITION

As at 31 December 2012

<b>CURRENT ASSETS</b>			
Sundry Debtors		-	652
<b>Total Current Assets</b>		-	652
<b>CURRENT LIABILITIES</b>			
Accounts Payable		169,251	652
<b>Total Current Liabilities</b>		169,251	652
<b>NON-CURRENT ASSETS</b>			
Investments	6	884,802	625,448
<b>Total Non-Current Assets</b>		<u>884,802</u>	<u>625,448</u>
<b>TOTAL NET ASSETS</b>		<u>715,551</u>	<u>625,448</u>
<b>REPRESENTED BY:</b>			
Trust Funds	7	0	626,100
<b>TOTAL TRUST FUNDS</b>		<u>0</u>	<u>626,100</u>

## NOTES TO THE FINANCIAL STATEMENTS

For the Year Ended 31 December 2012

### 1. Sundry Income

	31-Dec-12	31-Dec-11
Industry Funding	191,200	204,200
Consulting Income	144,650	-
	<u>335,850</u>	<u>204,200</u>

### 2. Investment Income

Investment Income / (Loss)	36,285	25,168
	<u>36,285</u>	<u>25,168</u>

Investment Gain / (Loss) for 2011 and 2010 was calculated at 4.5% on the average equity balance as per the Statement of Investment Policy Objectives, which is approved by University Council.

### 3. Scholarships

Postgraduate	53,333	57,048
Undergraduate	45,000	50,000
	<u>98,333</u>	<u>107,048</u>

### 4. Sundry Expenditure

EPE Centre Administration Support	-	8,748
EPE Energise your future	2,500	8,714
	<u>2,500</u>	<u>17,462</u>

### 5. Other Distributions

CPI Adjustment to Base Capital	7,257	-
Revenue Reserve	23,960	-
	<u>31,217</u>	<u>-</u>

The Base Capital adjustment is to maintain the purchasing power of the fund, spending this effectively reduces the capital of the fund. The Revenue Reserve is to be used as and when necessary, during years of low or negative Investment returns, to support the flow of distributions without recourse to reducing the capital of the fund. Note that there were insufficient investment returns to make a distribution to the Base Capital and the Revenue Reserve in 2011 the Board also agreed to meet the additional Scholarship costs of \$10,750.

### 6. Investments

As at 31 December 2012 the amount of \$884,802 (2011: \$625,448) is invested through the University Trust Fund. Investment of these funds is overseen by investment advisers, Eriksen & Associates. This is in a manner that is in accordance with the Statement of Investment Policy and Objectives.

### 7. Trust Funds

Balance at beginning of period	0	648,727
Net Operating (Deficit) for period	58,234	(22,627)
Other Distributions	31,217	-
Balance at end of period	<u>89,451</u>	<u>626,100</u>

### 8. Commitments

The PEET Board have agreed to meet (in 2013) the additional Scholarship costs of \$10,750 paid by the University of Canterbury in December 2012.

# Members

## Premium Members



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## Members



"safe, reliable, hassle free service"



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POWER  
ENGINEERING  
EXCELLENCE  
TRUST

"Promoting and supporting the education of power engineers and the study of power engineering as a field of excellence in New Zealand"