



CENTRE FOR RENEWABLE AND SUSTAINABLE ENERGY STUDIES

Annual Report 2008

**National Hub for the Postgraduate Programme in
Renewable and Sustainable Energy Studies**

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**March 2009
Prepared for: SANERI**



Centre for Renewable and Sustainable
Energy Studies



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Executive Summary

In this report an overview of the activities of the Centre for Renewable and Sustainable Energy Studies who is responsible for the Postgraduate Programme in Renewable and Sustainable Energy Studies at Stellenbosch University is presented for 2008. The academic programmes started in February 2007 with two coursework master degrees and other existing research masters' and doctoral programmes, in 2008 this was extended by another coursework masters degree. Fifty students received bursaries from the Centre last year while studying at five different universities. Thirteen bursary students received masters degrees in 2008 and early 2009. Eight postgraduate modules were presented and eight students graduated in 2008. A number of projects were successfully completed. Five forums covering various topics in renewable and sustainable energy were held, growing in popularity and attendance. Three spokes were identified and recommended for support to SANERI. The total expenditure of the SANERI funds in 2008 was R 5 315 022.69 with a surplus in the account at the end of the year of R 1 543 833.94. SANERI paid a total amount of R 5 589 000 to the Centre. A surplus of R 273 977.31 was realised on the approved budget from SANERI and this amount will be used in 2009 and 2010 for additional bursaries. The total income of the Centre grew 67,5% to R 7 381 552.15 while expenditure rose to R 5 993 192.12. The total reserves in the Centre at the end of 2008 was R 2 335 230.69. Of the 50 students receiving bursaries in 2008 36% were black and 26% female. These fall short of the original targets of 85% black and 45% female students. A number of steps were put in place to address this shortfall.

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1. Introduction

Stellenbosch University has been awarded the responsibility to act as the national hub of a Postgraduate Programme in Renewable and Sustainable Energy (RSE) Studies by South African National Energy Research Institute (SANERI), a division of the Central Energy Fund (CEF) in 2006. The model proposed in the original call for proposals was that of a hub that will be supplemented by a number of spokes in different fields of renewable and sustainable energy. The official launch of the Programme took place on Thursday 3rd August 2006 with the signing of the contract between Stellenbosch University and SANERI. The overall objective of this initiative is to develop and enhance national capacity in renewable and sustainable energy in support of accelerated and shared economic growth. This will be achieved by building human resource capacity, creating and disseminating knowledge, and finally by stimulating innovation and enterprise in the field of renewable and sustainable energy.

The primary objective of the Postgraduate Programme in Renewable and Sustainable Energy Studies at the University remains the training of scientists and engineers with the required technical expertise to unlock the country's renewable energy resources on the one hand and implement appropriate technology for using energy in a sustainable manner on the other. The programme started in February 2007 with approximately thirty students enrolled on the coursework masters degree and various research degrees. In 2008 seven postgraduate modules were presented, starting with general modules on renewable energy technology and policies and specialised modules on solar and bio-energy as well as a module on biomass production. A total of fifty students received bursaries from SANERI via the Centre while studying at five different universities in South Africa.

The Centre for Renewable and Sustainable Energy Studies (CRSES) at Stellenbosch University was established in 2007 to implement the intent of the contract between Stellenbosch University and SANERI and to manage this Programme. The Director of the Centre is Prof Wikus van Niekerk and the Associate Director, until January 2009, was Mr Saliem Fakir. The Centre is currently involved in a variety of renewable energy projects, from wave parks off the west coast to projects investigating the feasibility of concentrating solar power plants. A number of these projects were feasibility studies on the use of renewable energy for a variety of clients.

This is the third annual report of the Centre and spans the period 1 January to 31 December 2008. In this report the various activities of the Centre are presented, some of the challenges highlighted and the financial statements of the period 1 January to 31 December 2008 presented.

2. Academic Programmes

The academic programmes coordinated by the Centre currently consist of three coursework master degree programmes and a variety of research masters and doctoral degrees. The coursework master degrees are presented at Stellenbosch University, one in the Department of Mechanical and Mechatronic Engineering as an M.Eng. with an emphasis on RSE, one in the School of Public Management and Planning as a B.Phil./M.Phil. programme in Sustainable Development, with an option to specialise in RSE, and the third an M.For. degree in the Department of Forest and Wood Science in the AgriScience Faculty. More information on the structure of these three degrees can be found in Appendix B and at the following website: http://academic.sun.ac.za/crses/html/postgraduate_program.htm .

The research master's and doctoral degrees are available at various academic departments at Stellenbosch University and also other universities, in particular the universities of Cape Town, Pretoria and Nelson Mandela Metropolitan University. Students enrol for the research degree in the relevant academic department and work in that research group while completing their studies. A list of projects available at the various institutions cooperating with the Centre can be found at: http://academic.sun.ac.za/crses/html/research_topics.htm



The students enrolled for the three coursework master degrees, as well as some of the research students meet in a number of renewable and sustainable energy (RSE) postgraduate modules that are presented in a transdisciplinary manner at the Sustainability Institute, Lynedoch. These modules are presented in one week blocks where the students are required to do some preparatory reading, attend a week of coursework, consisting of a five and half days, at Lynedoch and then complete a number of individual assignments and projects. During the week of teaching students participate in lectures, tutorials, group discussions, projects and some site visits. In 2008 eight modules were presented and the numbers of students who attended are listed in Table 1.

Most of the modules are also registered with the Engineering Council of South Africa (ECSA) so that executive students who attend these courses will receive recognition towards their required continuous professional development (CPD points). The modules were also attended by some of the research students as well as staff members involved with the programme to improve their background learning and understanding of RSE.

Table 1: Attendance of RSE Modules for 2008

<u>Module</u>	<u>Presenters</u>	<u>Total</u>	<u>Coursework</u>	<u>Research</u>	<u>Staff</u>	<u>Executive</u>
Renewable Energy Systems	Prof Ryno Swanepoel	47	38	3	4	2
Energy Efficient Cities	Dr Daniel Irurah	21	19	0	0	2
Renewable Energy Policy	Saliem Fakir	25	23	0	0	2
Conventional Energy Systems	Riaan Meyer	16	16	0	0	0
Solar Energy	Prof Ryno Swanepoel & Prof Thomas Harms	25	19	1	0	5
Sustainable Biomass Production	Dr Bruce Talbot	12	11	1	0	0
Sustainable Land Use	Prof Paxie Chirwa & Anton Kunneke	19	18	0	0	1
Bio-Energy	Dr Johann Görgens & Team	22	21	0	0	1
Wind & Hydro Energy	Prof Theo von Backström & Team	21	14	4	2	1

For 2008 the following three new modules were added:

- Wind and Hydro Energy
- Sustainable Production of Biomass
- Sustainable Land Use

3. Students and Bursaries

In 2008 SANERI made an amount of R 2,4 million available for postgraduate bursaries.

Fifty students at five different universities in South Africa received bursaries in 2008 of whom 18 (36%) are black and 13 (26%) female in 2008. Of the 50 students 17 were enrolled for coursework masters programmes and 33 for research masters and doctoral degrees. Most students

progressed well; a number graduated in December 2008 or are expected to graduate early in 2009. In 2008 R 2 452 500 as well as R 310 000 for computers for the new bursary students. That is R 362 500 more than the R 2,4m received from SANERI for bursaries in 2008.

There was in total R 2 931 000 available for postgraduate student support in 2008. Of this only R 2 762 500 was paid out even though the Centre went to great lengths to find deserving students who qualified for bursaries. A list of the 2008 bursary students as well as those who graduated appears in Appendix A.

4. Projects

A number of projects were completed in 2008. The tables below indicate the scope of the completed, continuing and new projects.

<u>Project Description (Completed Projects)</u>	<u>Client</u>	<u>Amount</u>
Optimisation of heliostats for central receiver solar plant	Eskom	R 170 000
SWH feasibility study for the Hessequa Municipality	WCPG	R 150 000
Barriers of entry to RE	DEAT	R 70 000
Testing of Amasola SWH	SANERI	R 30 000
RE feasibility study for abalone farm	Roman Bay Sea Farms	R 20 000
CFD modelling of Agulhas Ocean Current	Eskom	R 30 000
Local support of international wind-farm developer	Windlab System	R 100 000
RE feasibility study of solar energy for scientific installation	NRF	R 200 000
In house course on RE	Tenesol	R 70 000
Wave energy converter analysis	Ocean Energy Management	R 100 000
Hydro and wind energy for farms, basic information	MBB Consulting Engineers	R 10 000
Chapter in Energy Efficiency Handbook	Sustainability Institute	R 10 000

<u>Project Description (Continuing Projects)</u>	<u>Client</u>	<u>Amount</u>
Study of RE demonstration centre	UNIDO	R 125 000
Feasibility study of RE in Free State agriculture	Free State Provincial Government	R 350 000
Feasibility study to use biomass to power 1 200 houses	Spier Estate	R 70 000

<u>Project Description (New Projects)</u>	<u>Client</u>	<u>Amount</u>
SWH study and training	Austrian Development Agency	R 500 000
Solar and wind resource mapping	UNEP	R 1 500 000
Feasibility study for new housing project using novel RE ideas	Africon/Eastern Cape Development Agency	R 350 000

On these projects both staff of the Centre as well as other expert consultants in the University and private industry combined to form strong, multi-disciplinary project teams.

The projects undertaken by the Centre range from initial feasibility studies for the deployment of renewable energy to highly technical studies done for clients. From time to time individuals are referred to the Centre for advice on new idea to harness renewable energy. Most of these ideas do not present feasible energy conversion devices. When the ideas can not be dismissed off-hand then further studies are recommended.

Specific research conducted in the Centre focus on wave energy conversion. In 2008 a new patent application was submitted. This patent extends the application of the original Stellenbosch Wave Energy Converter, or SWEC, to a shore-based unit. Additional funding for this research has been requested from the WWF/Eskom Renewable Energy Fund

5. Forums and Awareness Programmes

In order to fulfil the public awareness mandate of the Programme a number of RSE forums were held during the course of 2007. These events were very successful and well attended. Most of the forums also received additional coverage in the printed and radio media. The topics and attendance of the forums are listed in Table 2.

Table 2: Attendance of RSE Forums in 2008

<u>Topic</u>	Electric vs Hybrid Vehicles	Energy Storage	National and Local Grids	Climate Change	Solar Water Heaters
<u>Attendees</u>	95	105	55	60	70

The format of these forums is that two independent experts are invited to introduce the topic, typically twenty minutes each, and then the floor is opened for a general debate between the members of the audience with additional inputs from the experts. Afterwards a small reception is held for additional informal discussion between the participants. This format proved to be popular and successful and will continue in 2009.

In addition to the forums a school outreach project was initiated in 2008. Therese Lambrecht , an experienced project manager with a passion for climate change and renewable energy, developed material on climate change and renewable energy suitable for grades 6-9. Three schools were visited in 2008 to test the material and the programme will be extended in 2009.

6. Spokes and Partnerships

The proposed model for the Programme was that of a hub complemented with spokes. Spokes focus on a particular technology, e.g. solar energy, wind energy, etc. A process was undertaken in 2007 where calls were solicited from a number of universities and these were then evaluated by the Management Board of the Programme. The following three spoke applications were recommended to SANERI:

- *Photovoltaic Research and Teaching* from NMMU and University of Fort Hare
- *Solar Thermal Power Generation* from Stellenbosch University and University of Pretoria
- *Technologies for Wind Energy* from UCT and Stellenbosch University

SANERI was only able to provide start-up funding in 2008. This resulted in a significant scaling-down of the proposed activities. There is no clarity on the future funding of the spokes and at present no new spokes are being developed.

In 2008 the following universities were visited to discuss possible activities in renewable energy:

- University of Johannesburg
- University of Witwatersrand
- University of Fort Hare
- University of Cape Town

In a project funded by UNIDO the Centre facilitated the development of a strategy for a National Demonstration Centre, in close cooperation with SANERI and University of Johannesburg.

7. Staff

There were a number of staff changes in the Centre in 2008. Ms Nicola Cencelli, the academic sponsored from the SANERI funds in the Department of Mechanical & Mechatronic Engineering

left the University in July to return to Eskom. Dr Ben Sebitosi, previously at UCT, has been appointed in her place from 1 January 2009. Anita Kleinschmidt left and was replaced by Ms Jos Liebenberg. Mr Duncan Palmer joined the Centre as a research engineer.

Late in 2008 Saliem Fakir, the other academic position funded from the SANERI grant, also resigned from the School of Public Management and Planning to head the Living Planet section at the WWF. The process to replace him is underway.

The complete, full-time staff complement at the end of 2008 is shown in Table 3.

Table 3: Full-time staff complement

<u>Position</u>	<u>Incumbent</u>
Director	Prof Wikus van Niekerk
Associate Director	Mr Saliem Fakir (Resigned effective 31 January 2009)
Senior Lecturer (SOPMP)	Mr Saliem Fakir (Resigned effective 31 January 2009)
Senior Lecturer (M&M)	Dr Ben Sebitosi (Appointed from 1 January 2009)
Research Engineer	Mr Riaan Meyer
Research Engineer	Mr Duncan Palmer
Admin/Finance Officer	Ms Jos Liebenberg

8. Financial Reporting

In 2008 SANERI transferred R 5 589 000 to Stellenbosch University to support the Programme. These funds are all held in a separate cost point, cost point **11550**, to ensure easy auditing of how these funds were applied by the Centre according to the approved budget. In addition to the SANERI payments interest to the value of R 278 946.28 accrued in this cost point, mainly due to an early payment by SANERI of the second payment, to bring the total income for 2008 to R 5 944 078.95. Table 4 list the income into cost point 11550.

Table 4: Income received from SANERI for 2008

		<u>Budgeted</u>	<u>Actual</u>
SANERI:		<u>R 5 589 000.00</u>	<u>R 5 589 000.00</u>
	Core Grant	R 3 189 000	R 3 189 000.00
	Bursaries	R 2 400 000	R 2 400 000.00
Other:		<u>R 0</u>	<u>R 355 078.95</u>
	Interest		R 278 946.28
	Diverse Income		R 76 132.67
	Total for 2008	<u>R 5 598 000.00</u>	<u>R 5 944 078.95</u>

The budgeted and actual expenses of the funding received from SANERI in 2008 are reflected in Table 5.

The major variances in the actual expenditure from the budgeted amounts were for capital expenses and the additional bursaries. In the previous year SANERI made an additional amount of R 220 000 available for the laptop computers of the bursary students. In 2008 this was not the case and the amount of R 90 000 was budgeted from the core grant for this purpose. With 31 new bursary students this was overspend by R 220 000. An additional data projector was purchased as two are required, one at Lynedoch, which is also extensively used by the Sustainability Institute, and one in Stellenbosch. The additional bursary expenditure was planned for and would have come out of the surplus of the previous year. In total the actual capital expenses exceeded the budgeted amount by R 277 543.85. This was easily covered by the R 431 000 budgeted under the contingency for additional bursaries in 2008.



Although the amount budgeted for academic expenses was reduced from 2007 to 2008 only R 29 470 of this was utilised, mainly because most of the required library material required by the students was still purchased from the University Library's own budget.

In total R 5 315 022.69 of the R 5 589 000 received from SANERI was spent in 2008, only R 274 067.31 or 5% was not applied towards the expenses of the Programme. The reserve at the end of the year in this cost point came to R 1 543 833.94.

In addition to the SANERI funding other sources of funding were also developed in 2008. The one week of contact of the RSE modules at Lynedoch are made available as short courses to industry. In 2008 fourteen executive students attended the various modules generating a net income of nearly R 160 000. These funds are kept in a separate cost point, R1111, and the available funds in this cost point at the end of 2008 was R 289 224.68. The income on projects in 2008 grew from a low base in 2007 to approximately R 266 000 in 2008. The total reserves in the Centre, excluding the reserves in the SANERI cost point (11550) at the end of 2008 was R 791 396.75.

Audited financial statements are included in Appendix C. The first set is the consolidated income and expenditure for all the accounts (cost points) of the Centre. The second set represents only that of Cost Point 11550, the cost point in which all the SANERI funding are received and disbursed.

The premises at Lynedoch, consisting of a general office, a student office and a classroom, used by the staff and students of the Centre based at Lynedoch as well as the students during the presentation of the modules are sponsored by an annual grant of R 100 000 from the Spier Group. This three year grant will come to and end in December 2009.

The approved budget for 2009 requires a contribution from SANERI of R 6 146 500. In addition R 500 000 from the surplus in 2008 as well as R 300 000 from the core grant will be used to award additional bursaries in 2009. This was necessary since the increase of the bursary amounts for 2009 would not have left any funds for new awards. The remainder of the reserves will be kept to fund these additional bursaries should the SANERI funding for bursaries not increase in 2010. The complete budget for 2009 is shown in Appendix D.



Table 5: Expenditure for 2008 from SANERI Grant

		Budgeted	Actual	Variance
1. Staff		R 1 972 000.00	R 1 992 962.27	-R 20 962.27
	Centre Staff Cost	R 1 972 000.00		
2. Running Expenses		R 406 000.00	R 422 456.22	-R 16 456.22
	Telephone, fax and internet	R 28 000.00	R 43 746.34	R -15 746.34
	Stationary and printing	R 18 000.00	R 19 660.23	R -1 660.23
	Travel (Staff Members)	R 50 000.00	R 85 398.92	R -35 398.92
	Travel (Students, Visiting Academics)	R 40 000.00	R 9 349.70	R 30 650.30
	Advertisements (including Web)	R 150 000.00	R 152 620.77	R -2 620.77
	Website development & maintenance		R 8 667.40	R -8 667.40
	Conferences and workshops	R 70 000.00	R 52 941.36	R 17 058.64
	Community Projects	R 50 000.00	R 50 161.50	R -161.50
3. Academic Expenses		R 90 000.00	R 29 470.35	R 60 529.65
	Textbooks,	R 60 000.00	R 13 333.16	R 46 666.84
	Teaching material & notes	R 30 000.00	R 16 137.19	R 13 862.81
4. Capital Expenses		R 140 000.00	R 417 543.85	-R 277 543.85
	Office furniture and equipment	R 10 000.00	R 20 540.38	-R 10 540.38
	Classroom furniture	R 10 000.00	R 0.00	R 10 000.00
	Computers (Staff)	R 30 000.00	R 52 016.52	-R 22 016.52
	Computers (Students)	R 90 000.00	R 310 000.00	-R 220 000.00
	Facilities Renovation & Maintenance		R 34 986.95	-R 34 986.95
5. Contingency		R 581 000.00	R 0.0	R 581 000.00
	5% Contingency of total amount	R 150 000.00	R 0.00	
	Add Bursaries for 2008	R 431 000.00	R 0.00	
Total for 2008 (Core SANERI Grant)		R 3 189 000.00	R 2 862 432.69	R 326 567.31
7. Bursaries		R 2 400 000.00	R 2 452 500.00	-R 52 500.00
	Bursaries	R 2 025 000.00	R 2 077 500.00	
	Biofuel Research Chair Students	R 375 000.00	R 375 000.00	
	Total SANERI Grant for 2008	R 5 589 000.00	R 5 314 932.69	R 274 067.31



9. Equity Targets

In the Agreement signed between SANERI and Stellenbosch the following equity targets were set for the students funded with bursaries over the entire five year initial term:

- Black (including Indian and Coloured persons): 85%
- Female: 45%

In Section 3 it was reported that these targets have not been met. The following actions were taken to meet these very ambitious targets:

- Advertisements were placed in publications that are widely read in the targeted communities such as the Sunday Times and Sowetan.
- All suitable black candidates were carefully listed and followed-up to ensure that they apply for the available bursaries.

In selecting the successful candidates for the bursaries the following criteria was used to allocate priority to certain candidates:

<u>Equity</u>		<u>Excellence</u>	
Black Female	3 points	Distinction (75% +)	3 points
Black Male	2 points	Very good (65% to 75%)	2 points
White Female	2 points	Good (55% to 65%)	1 point
White Male	1 point	Poor (less than 55%)	0 points

The two points were added and all candidates with a total of 4 or more points were awarded a bursary in 2008. In addition some candidates with 3 points were awarded with bursaries. The successful candidates are listed in Appendix A. The demographics of all the students who received bursaries in 2008 are as follows:

White:	64%	Male:	74%
Black:	36%	Female:	26%

It is clear that the targets of 85% Black and 45% Female will be a challenge to meet. The current strategy which included personal contact and advertisements in national newspapers, which are widely read in the black community, led to an improvement in the number of new black students to 42% for 2008 however the participation of females declined to below 30%. It is clear that the largest constraint on meeting the targets is the demographic profile of the target market, Black students with a suitable bachelors or honours degree. It is well known that the numbers of Black students who participate in tertiary education programmes are still too low, and well below these demographic targets. What is even more problematic is that this programme is a postgraduate programme and that there are very attractive employment opportunities for Black graduates in South Africa, mainly driven by the skills shortage and employers trying to meet their own equity targets, which makes it even more difficult to attract Black students into the programme.

10. Conclusions

A number of objectives were met in the third year of the programme:

- The basic academic, administrative and financial structures were strengthened to execute the contract between Stellenbosch University and SANERI.
- The academic programmes consisting of two coursework master degree programmes were extended by another coursework masters programme in the Department of Forestry and Wood Science.



- During 2008 fifty students were supported with bursaries at five different universities in South Africa.
- Eight students received their masters' degrees in 2008.
- Five Discussion Forums on Renewable and Sustainable Energy topics were organised and well attended.
- A number of new projects in the field of renewable energy were undertaken.

All this was achieved while still realising a surplus on the funding received from SANERI and establishing a reserve in the Centre.

There were also some challenges to deal with:

- Both incumbents of the two academic positions sponsored with the SANERI funds resigned during the course of 2008.
- The resignation of the financial/administrative officer and finding a suitable replacement.

We look forward to a challenging and exciting 2009!



APPENDIX A: List of 2008 Bursary Students

No	Title	Surname	Degree	Dept	Supervisor
1	Mr	Maliage	MEng	Mechanical Eng	JL van Niekerk
2	Ms	Moloto	MPhil	SOPMP	G Haysom
3	Ms	Smit	MPhil	SOPMP	M Swilling
4	Mr	Du Toit	MPhil	SOPMP	A Muller
7	Ms	Maphiri	MFor	AgriSciences	P Chirwa
6	Mr	Ackerman	MScEng	Mechanical Eng	TW von Backstrom
7	Mr	Pierce	MScEng	Mechanical Eng	TW von Backstrom
8	Mr	Heyns	MScEng	Mechanical Eng	DG Kroger
9	Mr	O'Kennedy	MScEng	Industrial Eng	T v Schalkwyk
10	Mr	Griffen	MScEng	Process Eng	L Lorenzen
11	Mr	Palmer	MScEng	Process Eng	L Lorenzen
12	Ms	Viljoen	MScEng	Process Eng	J Gorgens
13	Mr	Rossouw	MScEng	Electrical Eng	M Kamper
14	Mr	Lombard	MScEng	Electrical Eng	M Kamper
15	Mr	Solomon	MScEng	UCT Electrical Eng	P Pillay / Sebitosi
16	Mr	Van Zyl	PhD	Mechanical Eng	T Harms
17	Mr	Crous	PhD	Process Eng	J Gorgens
18	Mr	Diedericks	PhD	Process Eng	J Gorgens
19	Ms	Leibbrandt	PhD	Process Eng	J Gorgens
20	Ms	Wilson	PhD	SOPMP	M Swilling
21	Mr	Mokheseng	MPhil	SOPMP	T Dodo / M Swilling
22	Mr	Gosa	MPhil	SOPMP	T Dodo / M Swilling
23	Mr	Du Toit	MPhil	SOPMP	T Dodo / M Swilling
24	Mr	Sibisi	MPhil	SOPMP	T Dodo / M Swilling
25	Ms	Ntoi	MPhil	SOPMP	T Dodo / M Swilling
26	Mr	Olivier	MPhil	SOPMP	T Dodo / M Swilling
27	Ms	Lagrange	MPhil	SOPMP	T Dodo / M Swilling
28	Mr	Rautenbach	MEng	Mechanical Engineering	JL v Niekerk
29	Mr	Joubert	MEng	Mechanical Engineering	JL v Niekerk
30	Mr	Malatji	MFor	Forrest & Wood Science	M Meincken
31	Ms	Botman	MSc	Forrest & Wood Science	B du Toit
32	Mr	Allen	MScEng	Mechanical Engineering	DG Kroger
33	Mr	Kotzé	MScEng	Mechanical Engineering	J vd Spuy / L Lorenzen
34	Mr	Prah	MScEng	Process Engineering	L Lorenzen
35	Mr	Hugo	MScEng	Process Engineering	H Knoetze / J Gorgens
36	Mr	Van der Merwe	MScEng	Process Engineering	H Knoetze / J Gorgens
37	Mr	Potgieter	MScEng	E & E Engineering	M Kamper
38	Mr	Stegmann	MScEng	E & E Engineering	M Kamper
39	Mr	Sager	MScEng - UCT	UCT - Electrical Engineering	A Khan
40	Mr	Morse	MScEng - UCT	UCT - Electrical Engineering	A Marquard
41	Ms	Caga	MSc - UFH	UFH - Chemistry	E Meyer



				Dept	
42	Mr	Nongauza	Masters - NWU	North West University	S Marx
43	Mr	Nquma	Masters - NWU	North West University	S Marx
44	Mr	Olivier	PhD - UP	University of Pretoria	J Meyer
45	Mr	Garach	BEng(Hons)/MEng	University of Pretoria	J Meyer
46	Ms	Hallquist	BEng(Hons)/MEng	University of Pretoria	J Meyer
47	Mr	Ntuli	BEng(Hons)/MEng	University of Pretoria	J Meyer
48	Mr	Roux	BEng(Hons)/MEng	University of Pretoria	J Meyer
49	Ms	Smith	BEng(Hons)/MEng	University of Pretoria	J Meyer
50	Mr	Coetzee	BEng(Hons)/MEng	University of Pretoria	J Meyer
51	Mr	Suliman	BEng(Hons)/MEng	University of Pretoria	J Meyer

The following students graduated in 2008:

Ms L Beviss-Challinor with a MEng (*cum laude*) in Mechanical Engineering, graduation in March 2008

Mr W Kruger with an MPhil, graduation in March 2008

Mr JH du Toit with a BPhil (*cum laude*), graduation in December 2008, continuing with his MPhil in 2009

Ms G Smit with a BPhil (*cum laude*), graduation in March 2008, continuing with her MPhil in 2008,

Ms K Moloto with a BPhil, graduation in March 2008, continuing with her MPhil in 2008

Mr James Joubert with an MScEng (*cum laude*) in Civil Engineering, graduation in March 2008, continuing with his PhD in 2009

Mr R Solomon with an MScEng in Electrical Engineering, graduation April 2008

Mr D Palmer with an MScEng in Porcess Engineering, graduation December 2008

The following students will graduate in March and April 2009

Mr T Gosa with a BPhil, graduation in March 2009, continuing with his MPhil in 2009

Ms C Lagrange with a BPhil (*cum laude*), graduation in March 2009, continuing with her MPhil in 2009

Mr MB Mokheseng with a BPhil, graduation in March 2009, continuing with his MPhil in 2009

Mr N Sibisi with a BPhil, graduation in March 2009, continuing with his MPhil in 2009

Mr R du Toit with an MPhil, graduation in March 2009

Mr M Maliage with a MEng in Mechanical Engineering, graduation in March 2009

Mr K Rautenbach with a MEng in Mechanical Engineering in March 2009

Ms G Smith with an MPhil (*cum laude*) in March 2009

Mr R du Toit with an MPhil in March 2009

Mr J Heyns with an MScEng in Mechanical Engineering in March 2009

Mr W Pierce with an MScEng in Mechanical Engineering in March 2009

Ms E Viljoen with an MScEng in Process Engineering in March 2009

Mr DV Garach with a BEng(Hons) in April 2009, continuing with his MEng in 2009

Ms M Hallquist with a BEng (Hons) in April 2009, continuing with her MEng in 2009

Mr MPM Ntuli with a BEng(Hons) in April 2009, continuing with his MEng in 2009

Mr SM Roux with a BEng(Hons) in April 2009, continuing with his MEng in 2009

Ms L Smith with a BEng(Hons) in April 2009, continuing with her MEng in 2009

Mr JAL Coetzee with a BEng(Hons) in April 2009, continuing with his MEng in 2009

Mr R Suliman with a BEng(Hons) in April 2009, continuing with his MEng in 2009



Appendix B: Coursework Masters Programmes

Postgraduate Programme in Renewable and Sustainable Energy Studies		
<p>M.Eng. (180 SAQA credits, 120 US credits) Coursework 90 Credits: (1 Math & 2 Mech Eng Modules (30 credits) 4 RSE Modules (60 credits) including Sustainable Development) Project 60 Credits</p>	<p><u>Coursework Masters Programmes</u></p>	<p>B.Phil. (120 US credits) M.Phil. (120 US credits) Coursework 120 Credits (8 Modules) (B.Phil.) Project 120 Credits (or 60 Credits and 4 additional Modules) (M.Phil.)</p>
<p>Engineering Modules (16 SAQA credits, 10 US credits):</p> <ul style="list-style-type: none"> <u>Mathematics: One of Linear Algebra or Partial Differential Equations</u> <p>Take at least two more for M.Eng. from:</p> <ul style="list-style-type: none"> <u>Conventional Energy Systems*</u> Advanced Heat Transfer Advanced Fluid-Dynamics Computational Fluid Dynamics Industrial Heat Exchangers Advanced Dynamics Advanced Strength of Materials Air-conditioning and Refrigeration Finite Element Structural Analysis <p>Required module from Sustainable Development Programme:</p> <ul style="list-style-type: none"> <u>Sustainable Development (15 US credits)</u> <p><u>Underlined</u> courses are required.</p>	<p>Renewable & Sustainable Energy Modules (15 Credits): (Take at least 4 for M.Eng. and B.Phil.)</p> <ul style="list-style-type: none"> <u>Renewable Energy Systems</u> <u>Renewable Energy Policy</u> <u>Solar Energy (PV and Thermal)</u> <u>Bio-Energy</u> <u>Energy Efficient Cities</u> <u>Wind and Hydro Energy</u> <u>Sustainable Production of Biomass</u> <u>Sustainable Land Use</u> <u>Advanced Energy Storage and Conversion Systems</u> <p><u>Underlined</u> courses are required.</p>	<p>Sustainable Development and Planning Modules (15 Credits each):</p> <ul style="list-style-type: none"> <u>Sustainable Development</u> <u>Sustainable Cities</u> <p>(Take at least two more for B.Phil.)</p> <ul style="list-style-type: none"> Leadership and Ethics Globalisation, Governance and Civil Society Applied Economics Corporate Citizenship Complexity Theory and Systems Thinking Biodiversity and Sustainable Agriculture Ecological Design for Community Buildings <p><u>Underlined</u> courses are required.</p>
<p>Host Department: Department of Mechanical & Mechatronic Engineering</p>	<p>Host departments: Mechanical & Mechatronic Eng., School of Public Management and Planning, Process engineering, Forest and Wood Science.</p>	<p>Host Department: School of Public Management and Planning</p>



Appendix C: Financial Statement, all cost points



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Statement of Income and Expenditure for cost centres 11550,11551,R1111
For the period ending :

	31/12/2008	31/12/2007
TOTAL INCOME	- 7 381 552.15	- 4 406 945.81
CONFERENCE/CONGRESS (NO VAT)	- 185 500.00	- 157 500.00
INCOME: BURSARY	- 19 478.24	0.00
INCOME: FOREIGN_ZERO RATE	- 259 140.01	- 91 739.95
INTEREST RECVD - INTERNAL ALLO	- 327 996.63	- 93 198.16
PROFIT/LOSS: EXCHANGE RATE DEB	- 6 122.22	0.00
PROFIT: EXCHANGE RATE FOREIGN	0.00	- 84.83
SALES TO INTERNAL ORG UNITS	- 1 500.00	0.00
SUNDRY INTEREST RECEIVED	- 6 547.32	- 985.19
SUNDRY INCOME: NON TAXABLE	- 5 644 351.80	- 3 853 500.00
SUNDRY INCOME: TAXABLE	- 930 915.93	- 209 937.68
TOTAL EXPENDITURE	5 993 192.12	3 323 024.51
CURRENT EXPENDITURE		
ADVERTISEMENTS - GENERAL	152 903.87	107 520.39
ADVERTISEMENTS - POSTS	30 000.00	4 457.72
AFFILIATION & REGISTRATION EXP	5 148.00	7 113.85
AUDIOVISUAL EXPENDITURE	320.00	4 413.67
BURSARY POST GRADUATE	2 806 100.00	1 571 850.00
BURSARY UNDERGRADUATE	2 000.00	0.00
CELL PHONE AIRTIME	726.05	0.00
CELL PHONE RENT	6 323.84	3 700.85
CLEANING MATERIALS	149.81	0.00
CLOTHING: OTHER	0.00	200.00
COMPUTER MATERIALS	13 379.25	12 147.75
CONSULTATION FEES	573 560.35	256 260.08
CONSUMABLE MATERIALS	6 872.97	20 626.86
COPY AND PRINTING	18 262.13	24 255.02
COURSES	2 660.00	10 212.00
ENTERTAINMENT - GENERAL	84 032.70	30 376.08
FLOWERS, WREATHS, GIFTS	7 360.80	4 450.90
FOREIGN EXCHANGE LOSS	1 917.31	0.00
FOREIGN TRAVEL & SUBSISTENCE	13 122.00	5 609.35
INTERNET NETWORK EMAIL LEVY	5 818.18	5 675.34
LCW NON- CAPITALISED	33 191.31	0.00
LEVY: SURCHARGE	18 810.00	8 550.00
MAINTENANCE OF APPARATUS EN/O	8 063.07	0.00
NON- CAPITALISED BOOKS	12 624.71	1 726.59
PHOTOGRAPHIC EXPENDITURE	52.63	0.00
POSTAGE, STAMPS EN TELEGRAMS	2 390.20	2 136.83
RENT OF EQUIPMENT- GENERAL	5 000.00	0.00
RENT OF ROOMS	200.00	2 540.00
SERVICES	6 015.00	4 700.00
SMALLER FURNITURE AND EQUIPMEN	14 594.56	64 805.75
SOFTWARE	2 850.00	3 344.93
STATIONERY	12 425.11	5 309.78
SUNDRY EXPENSES	15 661.85	0.00
TELEPHONE INSTALLATION COSTS	280.89	779.79
TELEPHONE: CALLS	11 755.28	9 114.77
TELEPHONE: RENT	18 842.10	13 508.35
TOTAL REMUNERATION	1 866 978.75	947 742.93





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Statement of Income and Expenditure for cost centres 11550,11551,R1111

For the period ending :	31/12/2008	31/12/2007
TRAVEL- & SUBSISTENCE (DEP'T)	58 694.28	86 519.48
TRAVEL- & SUBSISTENCE (NON TEA)	121 631.16	42 026.09
WORKSHOPS	9 930.00	0.00
ASSET TRANSACTIONS		
ASSET PURCHASES	42 543.96	61 349.36
OPERATING (SURPLUS) / SHORTFALL FOR PERIOD	- 1 388 360.03	- 1 083 921.30
FUNDS TRANSFERS	165 000.00	150 000.00
TRANSFERS FROM	165 000.00	150 000.00
NET (SURPLUS) / SHORTFALL FOR THE PERIOD	- 1 223 360.03	- 933 921.30
Plus: ACCUM (FUNDS) / SHORTFALL ON 01/01/2008	- 1 327 044.68	- 393 123.38
ACCUM (FUNDS) / SHORTFALL ON 31/12/2008	- 2 550 404.71	- 1 327 044.68
Min: BALANCE SHEET ITEMS	215 174.02	210 451.19
CREDITOR PROVISION BALANCING	- 2 736.00	0.00
DEB CONTR- DT SYSTEM	217 910.02	213 871.19
SURCHARGE CONTROL	0.00	- 3 420.00
FUNDS AVAILABLE ON 31/12/2008	- 2 335 230.69	- 1 116 593.49

JW Roux
Senior Director: Finance & Asset Management

Statements for SANERI Funds (CP 11550)



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Statement of Income and Expenditure - _Centre for Renewable Studies - 11550

For the period ending :

	31/12/2008	31/12/2007
TOTAL INCOME	- 5 944 078.95	- 3 940 705.03
INCOME: BURSARY	- 19 478.24	0.00
INTEREST RECVD - INTERNAL ALLO	- 278 946.28	- 87 120.20
PROFIT: EXCHANGE RATE FOREIGN	0.00	- 84.83
SUNDRY INCOME: NON TAXABLE	- 5 644 351.80	- 3 853 500.00
SUNDRY INCOME: TAXABLE	- 1 302.63	0.00
TOTAL EXPENDITURE	5 201 895.42	3 219 914.00
CURRENT EXPENDITURE		
ADVERTISEMENTS - GENERAL	147 903.87	102 219.39
ADVERTISEMENTS - POSTS	30 000.00	4 457.72
AFFILIATION & REGISTRATION EXP	5 148.00	7 113.85
AUDIOVISUAL EXPENDITURE	320.00	486.74
BURSARY POST GRADUATE	2 762 500.00	1 570 000.00
CELL PHONE AIRTIME	726.05	0.00
CELL PHONE RENT	6 323.84	3 700.85
CLEANING MATERIALS	149.81	0.00
COMPUTER MATERIALS	13 089.81	12 147.75
CONSULTATION FEES	312 056.40	253 773.90
CONSUMABLE MATERIALS	2 007.28	15 322.35
COPY AND PRINTING	14 987.23	24 160.02
COURSES	2 660.00	10 212.00
ENTERTAINMENT - GENERAL	26 098.28	23 999.03
FLOWERS, WREATHS, GIFTS	5 940.80	4 108.90
FOREIGN TRAVEL & SUBSISTENCE	13 122.00	5 609.35
INTERNET NETWORK EMAIL LEVY	5 818.18	5 675.34
LCW NON- CAPITALISED	21 700.11	0.00
MAINTENANCE OF APPARATUS EN/O	8 063.07	0.00
NON- CAPITALISED BOOKS	12 523.16	1 726.59
POSTAGE, STAMPS EN TELEGRAMS	1 988.16	1 660.61
RENT OF ROOMS	200.00	2 540.00
SERVICES	6 015.00	4 700.00
SMALLER FURNITURE AND EQUIPMEN	12 994.56	64 805.75
SOFTWARE	1 350.00	3 344.93
STATIONERY	12 425.11	4 976.71
SUNDRY EXPENSES	147.95	0.00
TELEPHONE INSTALLATION COSTS	280.89	779.79
TELEPHONE: CALLS	11 755.28	8 884.63
TELEPHONE: RENT	18 842.10	13 508.35
TOTAL REMUNERATION	1 606 935.15	925 242.93
TRAVEL- & SUBSISTENCE (DEP'T)	40 595.18	62 760.37
TRAVEL- & SUBSISTENCE (NON TEA	49 086.19	31 466.09
WORKSHOPS	9 930.00	0.00
ASSET TRANSACTIONS		
ASSET PURCHASES	38 211.96	50 530.06
OPERATING (SURPLUS) / SHORTFALL FOR PERIOD	- 742 183.53	- 720 791.03
FUNDS TRANSFERS	165 000.00	150 000.00





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Statement of Income and Expenditure - _Centre for Renewable Studies - 11550

For the period ending :

	31/12/2008	31/12/2007
TRANSFERS FROM	165 000.00	150 000.00
NET (SURPLUS) / SHORTFALL FOR THE PERIOD	- 577 183.53	- 570 791.03
Plus: ACCUM (FUNDS) / SHORTFALL ON 01/01/2008	- 963 914.41	- 393 123.38
ACCUM (FUNDS) / SHORTFALL ON 31/12/2008	- 1 541 097.94	- 963 914.41
Min: BALANCE SHEET ITEMS	- 2 736.00	0.00
CREDITOR PROVISION BALANCING	- 2 736.00	0.00
FUNDS AVAILABLE ON 31/12/2008	<u>- 1 543 833.94</u>	<u>- 963 914.41</u>

JW Roux

Senior Director: Finance & Asset Management



Appendix D: Approved Budget for 2009

		<u>2009</u>
Staffing		R 2 490 000
	Core staff	R 1 418 000
	Academic staff	R 1 072 000
Running Expenses		R 433 000
	Tel, Fax and Internet	R 33 000
	Stationary & Printing	R 20 000
	Advertisement & Website	R 150 000
	Conferences & Workshops	R 70 000
	Travel (Staff)	R 60 000
	Travel (Students and Visiting Acad)	R 40 000
	Community Projects	R 60 000
Academic Expenses		R 70 000
	Teaching Material & Books	R 70 000
Capital Expenses		R 140 000
	Office Furniture	R 10 000
	Classroom Furniture	R 10 000
	Computer Equipment (Students)	R 100 000
	Computer Equipment (Staff)	R 20 000
Bursaries		R 300 000
	Additional Bursaries	R 300 000 ⁴
Contingency		R 113 500
	2% of Total Budget for 2009	R 113 500
Total SANERI Grant (Operating Budget)		R 3 546 500¹
Bursaries		
	SANERI: General	R 2 345 000
	SANERI: Biofuel Chair Students	R 255 000 ³
	From Core SANERI Grant	R 300 000 ⁴
	From CRSES Reserves	R 500 000 ⁴
Total Available for Bursaries		R 3 400 000⁴
Total SANERI Grant (For Bursaries)		R 2 600 000²
Total SANERI Grant (Operating Budget)		R 3 546 500¹
GRAND TOTAL OF SANERI GRANT		R 6 146 500

Notes:

- ¹ R 3m escalated by 6,5% in 2007 and with 11% in 2008 as the actual and projected annual average CPIX.
- ² R 2,6m approved for bursaries in 2009 by SANERI.
- ³ R 255k reserved for the three PhD students currently receiving bursaries from the Hub but who work in the Biofuel Research Chair.
- ⁴ Total of R 3 400 000 budgeted for bursaries, R2,6m from SANERI, with R 300k from operating budget and another R 500k from CRSES reserves allocated towards bursaries in 2009.



Appendix E: New bursary students for 2009

CRSES New Bursaries for 2009					
	Name	Initials	Degree	Male/female	Equity group
Ms	Kritzinger	K	MPhil	F	White
Ms	Wassung	N	MPhil	F	White
Mr	Donkin	RP	MEng	M	White
Mr	Nkosi	SS	MEng	M	Black
Mr	Bekker	JC	MScEng	M	White
Mr	Gerber	S	MScEng	M	White
Ms	Ngewu	A	MScEng	F	Black
Mr	Joubert	JR	PhD	M	White
Ms	Gijar	SP	PhD	F	Indian
Mr	Wakeford	J	PhD	M	White
Ms	Waller	MK	MSc - University of Cape Town	F	White
Mr	Mabizela	PS	MSc - University of Fort Hare	M	Black
Mr	Thantsha	NM	PhD - NMMU	M	Black
Mr	Menzies	GH	MCom - NMMU	M	White
Mr	Mouzouris	M	MScEng - UKZN	M	White

} Stellenbosch University