



South African National Energy Research Institute

Call for Proposals

Postgraduate Programme in Energy efficiency and Demand Side Management

Key Dates

31 October 2007	Publication of Call-for-Proposals
30 November 2007	Closing date for bids
30 January 2008	Announcement of bid winner
15 February 2008	Contract signing
30 March 2008	Disbursement of set-up grant

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1. Introduction and overview

The South African National Energy Research Institute (SANERI) wishes to provide funding for the establishment of a Postgraduate Programme in Energy Efficiency (EE) and Demand Side Management (DSM). Initial funding of a minimum of R3 million per annum for a period of five years will be made available to a University within South Africa to establish a hub for a national programme of postgraduate teaching and research. The hub will establish a postgraduate Masters and Doctoral Programme with associated research projects. The hub will also sub-contract and manage research projects elsewhere in South Africa. Additional funding is being finalised and will be made available at a subsequent stage for the sub-contracted national programme.

The overall aim of the initiative is to develop and enhance national capacity in Energy Efficiency (including fuel switching to renewable technologies) and Demand Side Management in support of accelerated and shared economic growth within the bounds of environmental, social and economic sustainability. The specific objectives are threefold: first to build human resource capacity; second to deepen knowledge; and third, to stimulate innovation and enterprise in the field of Energy Efficiency and Demand Side Management.

Universities are invited to submit bids to act as the hub of a new, national postgraduate programme in Energy Efficiency and Demand Side Management. This call-for-proposals is deliberately designed to be open-ended and considerable scope is provided for bidders to propose innovative approaches for this new national programme. This can involve international linkages.

2. Background Context and National Priorities

South Africa aims to achieve accelerated economic growth while at the same time improving service delivery and poverty alleviation. The government is also committed to sustainable development and a range of related policies and implementation programmes have been developed, or are the process of being developed, at national, provincial and local government.

Science, technology and innovation are seen as critical inputs to these goals. The Department of Science and Technology (DST), along with other relevant government departments and sector stakeholders, has developed a National R&D Strategy and a Ten Year Plan which identifies energy security as a grand challenge for R&D in South Africa. The Department of Minerals and Energy has published an Energy Efficiency Strategy in April 2005. The South African National Energy Research Institute (SANERI) has been established to take the lead in Public Interest Energy R&D on behalf of government.

Government is committed to expanding its funding support for energy research. This call-for-proposals is one of a number of initiatives to develop and enhance human capital, knowledge and innovation in the field of Energy Efficiency and

demand side management. SANERI will be the vehicle for contracting the programme and disbursing funding.

3. Programme Specification

Universities in South Africa are invited to bid for a minimum grant of R3 million per annum for an initial contract period of 5 years to establish the hub of a Postgraduate Programme in EE and DSM. The grant may be renewable for a further period, subject to funding availability and performance. Additional funding may be made available for a sub-contracted national programme of research involving additional centres around the country that will specialise in specific areas of EE and DSM (see below).

The programme will focus primarily on energy efficiency in the following sectors electricity (residential, mining, industrial, commercial) and transport (airports, rail, freight). The programme could encompass the entire EE and DSM chain, from end-uses back to energy-use devices, to energy transport systems, to energy conversion and production technologies, back to energy resources. If a particular group can demonstrate superior strength in a particular area, then spokes to this hub can be proposed subsequently to address the programme's needs. While much of the R&D focus will be on the science and technology of Energy Efficiency and demand side management, attention will also be given to related policy, regulatory, economic, financial, business, social and environmental R&D issues.

While this proposal represents a step-change in the quantum of national funding for research and teaching in the area of Energy Efficiency and demand side management, the amount of funding in relation to needs and opportunities is limited. Hence, the programme will need to be targeted and focused on priority areas that are relevant to South Africa and the Southern African region. While research will be primarily focused on short (less than 5 years) to medium term (5 to 15 years) challenges, the education programme should also equip students to research not only the applied areas, but also to embark on more fundamental, open-ended enquiries. Emphasis will be placed on public-interest research – i.e. funding will be directed to areas where EE and DSM technologies and systems have not yet found commercial application – or where significant market barriers still exist. Outreach programmes that affect communities not supplied by mainstream grid-connected electricity supply should also be developed. This will raise awareness of the benefits of energy efficiency in communities that have high energy costs relative to income.

The postgraduate programme will have three distinct elements:

- a. Masters and Doctoral programme
- b. Research projects
- c. Market transformation and enterprise development initiatives

The Masters and Doctoral programme will be created initially within a single university (the programme Hub) – although linkages with other Universities will subsequently be established. Funding will also be available for in-house research

projects that are linked mostly to postgraduate students. The hub will also commission, sub-contract and manage research and market transformation projects around the country.

While teaching and research are traditionally seen as core university activities, it is also recognised that universities also have broader societal and development responsibilities. Hence, this programme will also encourage links with relevant off-campus organisations, businesses and industries. Maximum synergies should be sought between research, teaching and market transformation/ enterprise development.

Cognisance should be taken of the considerable amount of international activity in this field, particularly in EE and DSM, but also in transportation, as it applies to the local situation. Strong international linkages are encouraged.

3.1 Masters and Doctoral Programme

The first objective of this programme is to make a step-change in human capital development. The programme will contribute to the development of a new generation of committed and capable young professionals interested in careers in research, innovation, market transformation and enterprise development in EE and DSM.

Masters degrees will be offered through a research dissertation or a combination of taught courses and a mini-dissertation. While the emphasis will be on the science and technology of EE and DSM, the programme should be multi-disciplinary and should be able to offer study streams suitable for students from different disciplinary backgrounds, including science, engineering, planning, economics, social-sciences, etc. Core introductory and foundation courses could be offered for all students in *EE and DSM Resources, Technologies and Systems* – as well as in the *Policy and Economics of EE and DSM*. In addition, courses could be available for students with specific disciplinary backgrounds, including advanced technology courses for those with science and engineering backgrounds. Consideration might be given to short, modular courses to allow part-time Masters students to also register for course work.

Opportunities should also be available for Doctoral research students.

Funding will be available for curriculum development for the courses, as well as for teaching and supervision time of staff. An important feature of the programme will be the availability of dedicated bursaries to attract good Masters and Doctoral students. The core grant could be supplemented by a parallel programme of postgraduate bursaries in energy research offered by SANERI/NRF.

While the heart of the postgraduate teaching programme will be located at the university programme hub, it is also envisaged that the subsequent programme of sub-contracted projects will result in other universities offering *research* Masters

and Doctoral degrees in specialist areas. However, the course component at the hub/university should be as comprehensive as possible.

3.2 Research Programme

In addition to teaching and supervision, funding will be available for the costs of research projects linked to Masters and Doctoral students and also the core faculty.

The programme should be guided by the National EE Strategy (DME, 2005), the Draft National Energy R&D Strategy (10th Order Draft, 2007) and priority areas identified by SANERI and its advisory bodies. The programme may also propose additional methodologies and approaches for establishing research priorities. Student research projects should, as far as possible, be directed towards these priority areas – although some space should also be available for more open-ended enquiry and development of fundamentally new, innovative approaches to problem solving.

Given the overall limitation on resources, as well as priority needs, a degree of specialisation is inevitable. While the programme hub may focus on particular areas of research, the subsequent sub-contracted programme will allow complementary areas of specialisation to develop at other centres.

The programme should give emphasis to the dissemination of research results – primarily in peer reviewed journals, but also through other media – such as an active website, seminars and conferences, and the knowledge management initiative of SANERI.

3.3 Market transformation and enterprise development initiatives

Many EE and DSM technologies, processes and systems face market barriers to widespread commercial application. Market transformation can be assisted through enabling policies, access to finance, the employment of appropriate business models, information and awareness campaigns and the development of appropriate technology and capabilities. While this programme focuses primarily on science and technology, attention also needs to be given to the other areas of market transformation. It is thus envisaged that some of the research projects will also encompass policy, finance, and business-model challenges – and that these aspects will also be included in the teaching programme.

The programme will be encouraged to link with off-campus initiatives aimed at creating sustainable markets in EE and DSM. Examples are the large energy saving projects managed by ESKOM and NEEA.

It is recognised that these market transformation initiatives are complex and can involve substantial resources. It is not envisaged that the programme duplicates other initiatives such as science parks, innovation hubs, and enterprise and business development. However, opportunities should be explored for working

with relevant partners and linking research and teaching working with market transformation activities. Bidders are encouraged to submit ideas and plans in this regard.

3.4 Sub-contracted programmes and projects

This call-for-proposals is essentially for the establishment of the hub of a national postgraduate programme in EE and DSM. The initial focus is on establishing a postgraduate teaching programme and related research and market transformation projects. The second-stage of this initiative will be to provide funding for a sub-contracted programme of research at other universities and centres. It is envisaged that specialist and complementary areas of research, along with associated postgraduate research students, will emerge and/or be consolidated at these other centres.

The university hub for this programme will have primary responsibility for managing its own teaching and research programme. However, it will also be awarded ring-fenced funding for sub-contracted programmes and projects to these other centres. The hub will thus have to establish appropriate management and administrative systems, including calls-for-proposals, contracts, performance monitoring, etc. This aspect of the national postgraduate programme in EE and DSM will be elaborated in subsequent interactions between SANERI and the successful hub university.

3.5 Programme leadership and management

The successful bidding university should be able to demonstrate a track record in teaching and research in energy studies. It should have adequate and reputable staff able to provide core teaching and/or should be prepared to recruit such staff to run the programme.

The successful bidding university should either have an incumbent Professor who will assume leadership of this programme, or the university should be prepared to recruit and/or promote a staff member to the position of Associate or Full Professor to lead the programme. Such a position need not be a tenured Chair (although this would be preferable); it could also comprise a long-term contract for a staff member funded initially from this grant. It is important that the head is able to dedicate the majority of his/her time to this programme.

The head of the programme should be supported, by a number of additional staff members who will contribute to teaching, research supervision and management of the programme. These staff could either be on the full-time staff complement of the university or could be staff employed on contracts. The university should involve a network of off-campus professionals in assisting with the teaching and supervision of projects.

Additional project management capacity for sub-contracted projects will be funded in subsequent negotiations.

3.6 Linkages with off-campus expertise

It is recognised that a great deal of expertise in South Africa in EE and DSM is located amongst off-campus organisations, businesses and individuals. A successful national programme of teaching and research will depend to some extent on the involvement and integration of these off-campus groups and individuals in taught courses and in university and student research projects. The successful bidding university will propose mechanisms whereby off-campus experts may be involved in teaching and in supervision of Masters research projects (for example, as adjunct or honorary professors or lecturers or research associates) – and also that research students be offered opportunities of internships and projects in off-campus organisations. Market transformation and enterprise development initiatives will inevitably involve a high degree of cooperation with off-campus industries, organisations and individuals. Universities are encouraged to work with these off-campus experts in the preparation of their bids. Novel ideas that tap into international expertise is encouraged.

3.7 International linkages

The programme will emphasize national and regional priority areas that support accelerated growth and improved social equity and environmental sustainability. However, the programme needs to be aware of international frontiers in EE and DSM research and development. The successful bidding university should demonstrate a commitment and track record of interaction and collaboration with leading international research groups, not only in industrialised countries, but also in other developing countries and emerging markets. Exchange visits, including sabbaticals and visiting fellowships will be encouraged. Visits by leading international scholars could significantly enhance the quality of local teaching and research programmes.

3.7 Transformation

This programme should contribute to national goals of transformation and bidders should indicate strategies and plans to redress past racial and gender imbalances through providing accelerated opportunities for black and female South Africans – both at the student and staff levels. The bidding group MUST demonstrate success in attracting, mentoring and graduating members from disadvantaged groups. The Hub will be measured on its success in this area and targets will be specified during contract placement. These targets will be based on those set by the relevant Sector Education and Training Authority. These targets will apply to both race and gender profile of students FUNDED by the programme. The Hub

may, at its own discretion, attract students outside of the intended profile group, but will have to account separately for them in the report back to SANERI.

3.8 Programme sustainability

Initial funding will be for five years, although funding may be provided for subsequent periods – subject to the availability of funds, performance and teaching and research outputs. Bidders should provide a five year budget indicating expenditure categories (Professorship, additional staff, bursaries, research, etc), funding needs, and potential additional sources of funding. Alternative budgets could be prepared indicating different scales of activity. The successful bidding university should indicate how the programme might achieve sustainability in the medium to long-term through the growth of course fees and Higher Education subsidies, and through additional sources of external funding.

4. Programme governance and performance monitoring

In addition to the usual departmental and faculty governance structures within the university, the programme will have a Management Board comprising up to ten members with knowledge and experience in a range of EE and DSM areas as well as different sectors, including academia, research, industry, utilities and government. The members will be selected in consultation with DST/SANERI. The Management Board will be chaired by the administrative head of the Hub, as appointed by the host university.

The Management Board will provide overall strategic guidance to the programme and will also be responsible for monitoring performance and outputs. The programme will produce annual plans and budgets and will provide annual reports detailing teaching, research and market transformation activities and outputs, as well as financial reports.

5. Contract

SANERI will enter into an initial five year contract with the winning university for an initial R1 million (once off) set-up grant, a minimum grant of R3 million per annum for the running of the hub and an additional R1.4 million per annum for bursaries. The intention is to conclude the contract and pay the initial set-up grant by the 30 March 2008. The final disbursement of the grant funding for the hub and bursaries will be made as soon as the programme has been developed. The contract will subsequently be supplemented by additional funding that will be ring-fenced for sub-contracts with other universities and external parties subject to funding availability.

The contract may be renewed for a further period, subject to the availability of funds and satisfactory performance.

This contract does not represent any exclusivity with regard to government funding of EE and DSM. It is envisaged that DST/SANERI will fund additional projects. The NRF may also fund additional research and bursaries.

6. Bid documentation

Bids may be submitted by University research centres or programmes. These should preferably include collaboration and participation from relevant University departments and also off-campus expertise. An indication should be provided in the bids of the level of support from Departmental Heads, Deans or the Deputy Vice Chancellor responsible for research.

Bid documentation should include details on at least the following:

- a statement of overall programme purpose and intent
- an initial assessment of needs, challenges and priority areas for Energy Efficiency and demand side management in South Africa
- track record in teaching and research in EE and DSM
- an overview of the proposed teaching, research and industry-linked programme
- an outline of the proposed Masters and Doctoral programme, including possible courses and areas to be taught
- an indication of priority research areas for the hub
- the approach to attracting and utilising other research centres as spokes of the Hub
- proposed approach towards market transformation and enterprise development initiatives
- core staffing (existing): positions, names, qualifications, experience, CVs
- core staffing (to be recruited): positions, qualifications, experience
- associate or adjunct faculty: institutions, organisations, businesses, industries, individuals – proposed modus operandi
- interaction and linkages with relevant off-campus organisations, industries, businesses, individuals
- possible international linkages
- transformation status, priorities, strategy
- programme and institutional sustainability
- programme management and administration: hub – plus sub-contracted work
- planned programme outputs
- programme governance and performance monitoring
- programme budget(s)
- leverage of additional funding

7. Evaluation criteria

The following criteria and weightings will be taken into account in assessing bids to host the hub of this new Postgraduate Programme in EE and DSM.

	Criteria	Weighting %
1	Overall understanding of need and potential for a new post grad programme in EE and DSM	5
2	Track record in energy research and teaching	10
3	Quality and experience of existing staff	15
4	Plans to recruit new staff	5
5	Design of taught Masters programme	15
6	Approach to prioritisation of research projects and planned research programme	10
7	Possible market transformation initiatives	5
8	International linkages	5
9	Linkages with and involvement of relevant off-campus organisations, industry and individuals – including plans for adjunct faculty	10
10	Transformation: existing status, plus strategies and plans	10
11	Programme management capacity and systems	5
12	Programme sustainability, including leverage of additional funding	5

8. Timeline

The closing date for bids is **noon on 30 November 2007**. Bid documents should be delivered to:

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It is planned that the bid winner will be announced in March 2008 and the contract and grant disbursement finalised soon thereafter.