

With global warming in the spotlight, alternative sources of energy have been a hot topic in recent years. Beyond global environmental issues, the electricity crisis is a big concern in South Africa, and most of us have probably experienced the inconvenience of load shedding. Fortunately there are people like Nonhlanhla Precious Cele, an energy researcher at the Tshwane University of Technology.

Energy Researcher

By Jeanne du Plessis

Alternative sources of energy

“We’re trying to improve the efficiency for alternative sources of energy. At the moment South Africa is dependent on coal, and there’s a shortage of electricity. I conduct research on alternative energy sources, such as fuel cells. A fuel cell is a device which converts chemical energy (hydrogen), to electricity without producing toxic emissions. I also prepare new materials, such as carbon nanotubes and polymer nanocomposites, which can be used in such energy sources to improve performance or efficiency,” Nonhlanhla explains. .

Energy research sounds complicated ...

Indeed, energy research is a complex and specialized field, and prospective energy researchers will need at least a Masters degree in Natural Sciences. Nonhlanhla has a PhD in Physics, which certainly wasn’t easy to obtain. Nonhlanhla fell pregnant during her first year of university, but with the support of her mother, managed to go all the way up to Doctorate level anyway, despite falling pregnant again during her first year of Doctoral studies. She adds that few women get to this level, and that she didn’t receive much support from her mostly male fellow students. “I got a lot of negative comments from the male students, who didn’t think I’d be able to finish the degree,” she recalls. Nonhlanhla proved them all wrong, becoming the first woman to get a PhD in Physics at the University of Zululand, as well as the youngest student in the department to obtain this degree.



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Quick facts

Salary

R169 000 – R420 000 per annum

Qualifications

Masters degree in Natural Sciences

Working hours

Office hours with some overtime

Places of Employment

Sasol

Eskom

Electronics companies

The petroleum industry

Universities

Research institutions

The ups and downs

If you're interested in alternative sources of energy, have a scientific mind as well as the dedication and persistence necessary for research, this could be the career for you. You can, among other things, expect to spend a lot of time in the laboratory. "It's not easy to keep to office hours because as a researcher I work in laboratories, write reports for journal publications, prepare conference presentations and attend meetings. Sometimes I also give lectures at the university," Nonhlanhla states. As a result of this busy schedule, Nonhlanhla frequently takes work home with her, which often results in little time being left over for her family.

However, the rewards of this career make up for its demanding nature. Nonhlanhla explains: "It's exciting to get new or innovative results in the laboratory, and to publish these results in a journal. It's very rewarding to see my article being cited by researchers. I was excited when I discovered that one of my articles was the second most accessed in the journal Macromolecular Materials and Engineering."

Unfortunately, current funding for energy research in South Africa is limited, and many of the scientists and funding in this field come from other countries. Nonhlanhla states that at this stage, it's very difficult to convince investors to financially support this research. But if you're looking further afield, there're many more opportunities overseas for researchers in this field of expertise.

A bright future

Whether you're interested in working in South Africa or overseas, you can look forward to lots of exciting opportunities and a rewarding career. "The future is bright and sky is the limit! We use energy every day, from the geyser that heats your bath water, to the kettle that boils your water for coffee, to the laptop that you take to work and the car you drive. By providing alternative sources of energy, which will hopefully become commercially available in the future, this research will change the future of energy supply," Nonhlanhla insists. And what more could you ask for in a career? ■

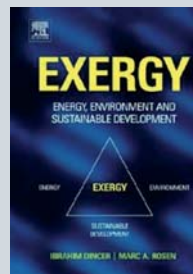
*"The future is
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Read about it

Exergy: Energy, Environment and Sustainable Development

Author: Ibrahim Dincer; Marc Rosen



During the past two decades, there have been revolutionary changes in the way thermodynamics is taught, researched, and practiced. Today, an increasingly strong emphasis is placed on exergy aspects of systems and processes, to improve understanding and assist in thermodynamic optimization. The book is research-oriented, and therefore includes practical features in a usable format, often not included

in other - solely academic- textbooks. Theory and analysis are emphasized throughout in this comprehensive book, reflecting new techniques, models, and applications. This book is an essential tool for anyone interested in exergy, and its relevance to various systems and applications.

Review by Kalahari.net

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Subject guidelines

English or Afrikaans
Mathematics
Physical Science

Places to study

UNIVERSITY OF PRETORIA
Tel: 012 420 3111
BSc Chemistry
3 years' full-time study
www.up.ac.za

UNIVERSITY OF JOHANNESBURG
Tel: 011 559 4555
BSc Chemistry and Physics
3 years' full-time study
www.uj.ac.za

CAPE PENINSULA UNIVERSITY OF TECHNOLOGY
Tel: 021 460 3176
National Diploma in Analytical Chemistry
3 years' full-time study
www.cput.ac.za

UNIVERSITY OF THE WITWATERSRAND
Tel: 011 717 1000
BSc Physics
3 years' full-time study
www.wits.ac.za

STELLENBOSCH UNIVERSITY
Tel: 021 808 9111
BSc Physics
3 years' full-time study
www.sun.ac.za

Interesting websites

Council for Scientific and Industrial Research
www.csir.co.za
South Africa's National Energy Research Institute (SANERI)
www.saneri.org.za
SAASTA
www.saasta.ac.za