

**Centre for Energy Research**  
*Seeking sustainable solutions for Africa*



# Renewable Energy Research



## About Us

The NMMU Centre for Energy Research (CER) was established in 2006 to seek solutions in sustainable energy solutions. The CER commitment and research output has been such that it is already recognised as a nationwide leader in renewable energy.



## About Us

"Energy Research for Africa for Tomorrow"

The Centre for Energy Research (CER) comprises energy research activities from the Faculty of Science, the Faculty of Engineering, the Built Environment and Information Technology, and the Faculty of Business and Economic Sciences at the NMMU.



## Mission

The CER is a research based entity that strives to serve the energy research needs of Africa by means of training students and conducting applied energy research.

**Faculty of Science**  
*Discovering tomorrow*

**Faculty of Engineering, the  
Built Environment and Information Technology**  
*Technology for tomorrow*

**Faculty of Business & Economic Science**  
*Managing tomorrow*



## The CER is actively involved in various renewable energy research projects such as:

- Photovoltaics
- Solar thermal energy
- Wind energy
- Energy Storage and Materials Characterization
- Energy Forecasting and Modeling



## **We offer interesting MSc and Phd projects in these fields, including:**

- **Concentrator photovoltaics (CPV):**
  - Optical design of both low and high concentration systems
  - Thermal management in CPV modules
  - CPV module electrical design – characterization and configuration of solar cells
  
- **Energy meteorology and energy forecasting:**
  - Wind and solar resources assessment
  - Correlation of device performance with resource

## We offer interesting MSc and Phd projects in these fields, including:

- **Solar thermal:**
  - Investigation of theoretical energy prediction models for solar absorbers and complete systems
  - Development of new evaluation techniques and characterization of SWH systems and components
- **Wind energy:**
  - Innovation and development of small wind turbines
- **Hybrid systems** (wind/PV/hydro)





## Photovoltaics Research

Our research team has interaction with local and international PV companies and research institutes.

Research activities cover a wide range of topics, including:

- PV cell, module and systems characterisation
- Outdoor Current-Voltage measurement system development
- Device parameter extraction
- Light Beam Induced Current (LBIC) measurements (laser and solar radiation as probe beam)
- Concentrator PV (CPV) development
- PV systems research

**Contact Prof van Dyk for more details (041 5042255)**





## **Solar Water Heating Research**

Our research team has interaction with local and international SWH companies. Research activities cover a wide range of topics, including:

- Development of new evaluation techniques for SWH systems and components
- Outdoor characterization of SWH systems and components using standard and new evaluation techniques
- Development of automated outdoor measurement system for SWH parameter extraction
- Development of novel absorber, tank and control systems
- Evaluation and design of hybrid SWH and heat pump systems

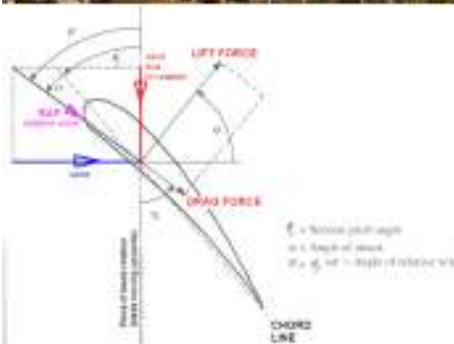
**Contact Dr Vorster for more details (041 5043051)**



## Wind Energy Research

Our research team has interaction with local and international wind energy companies and research institutes. Activities are currently focused on vertical and horizontal axis micro wind turbines:

- Development of new evaluation techniques for micro wind turbines and components
- Outdoor characterization of micro wind turbines and components using standard and new evaluation techniques
- Development of novel vertical and horizontal axis micro wind turbine and control systems



**Contact Dr Vorster or Dr Phillips for more details  
(041 5043051)**

## **Collaboration / linkages**

- DST
- Eastern Cape Government (Department of Economic Development and Environmental Affairs)
- Nelson Mandela Bay Municipality (NMBM)
- Cacadu District Municipality
- Centre for Sustainable and Renewable Energy Research (CRSES)
- University of Fort Hare
- East London IDZ
- Coega Development Corporation
- Eskom
- Telkom
- Tasol Solar.
- Genergy
- Africoast Consulting Engineers

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