



CENTRE FOR RENEWABLE AND SUSTAINABLE ENERGY STUDIES

# 5<sup>th</sup> RENEWABLE ENERGY POSTGRADUATE SYMPOSIUM

13 – 14 JULY 2015

Knowledge Centre  
Faculty of Engineering  
Stellenbosch University



science  
& technology

Department  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



SOLAR THERMAL ENERGY  
RESEARCH GROUP



National  
Research  
Foundation

# Programme

## Day 1 – Monday, 13 July 2015

08h00 - 08h30 Registration, Tea & Coffee

### Session 1 – Chair: Prof Wikus van Niekerk

08h30 - 08h40	Opening Session	Prof Wikus van Niekerk
08h40 - 09h20	Keynote Address	Prof Johann Görgens
09h20 - 09h30	Questions/discussion	
09h30 - 09h50	Waste-to-energy Technologies: Bottlenecks Impeding Adoption in South African Local Municipalities	G Mutezo
09h50 - 10h10	The Design of a Waste Heat System Capable of Harnessing Energy from the Surface of a Cyclone Dust Collector attached to a Downdraft Biomass Gasifier	N Nwokolo
10h10 - 10h30	Integrated Jerusalem Artichoke Biorefinery for the Production of Bioethanol and High Value Products	P Maumela
10h30 - 10h50	Techno-Economic Assessment of Processes that Produce Jet Fuel from Plant-Derived Sources	G Diederichs

10h50 - 11h10 Tea & Coffee

### Session 2 – Chair: Alejandro Lupion Romero

11h10 - 11h30	Numerical Optimisation of Small Scale Wind Turbine through the use of Surrogate Modeling	G Erfort
11h30 - 11h50	Design of an Ironless Double-Rotor Radial Flux Permanent Magnet Machine	G Oosthuizen

11h50 - 12h10	Simplified Analysis Technique for Double Layer Non-overlap Multiphase Slip Permanent Magnet Couplings in Wind Energy Applications	P van Wyk
12h10 - 12h30	Optimal Design Methodology of a three phase Rotary Transformer for a Doubly Fed Induction Generator Application	N Zietsman

12h30 - 13h10 Lunch

### Session 3 - Chair: Prof Alan Brent

13h10 - 13h30	An Economic Assessment of the Concentrated Solar Power with National Energy Regulator of South African Feed-in Tariff Scheme	C Chukwuka
13h30 - 13h50	Comparing the Implications of Telecommunications Services and Energy Access on Small Scale Agriculture in Kenya and Zimbabwe	T Mambo
13h50 - 14h10	Structured Participatory Decision Processes to Promote Energy Sustainability at a City Level: A Systematic Review	E Fouche
14h10 - 14h30	Economic Impacts of Mechanisation and In-House Renewable Energy Generation and Integration in African CPO Mills	R Padi
14h30 - 14h50	An Investigation into the Financial Impact of Embedded Generation at Household Level on Local Governments in South Africa: The Case of Stellenbosch Municipality	N Korsten

14h50 - 15h10 Tea & Coffee

## Session 4 – Chair: Prof JL van Niekerk

15h10 - 15h50	Guest speaker - Tidal Lagoon Swansea Bay and other Lagoons in the UK	Mr Ton Fijen
15h50 - 16h00	Questions/Discussion	
16h00 - 16h20	Characterisation of the Agulhas Current as a Resource for Marine Energy Extraction	I Meyer
16h20 - 16h40	Observed Eddy Dissipation in the Agulhas Current	L Braby
16h40 - 17h00	Design and Modelling of a Single SWEC Chamber	J Fairhurst
17h00	Closure	
18h30 - 21h45	Dinner	

## Day 2 – Tuesday, 14 July 2015

08h30 - 09h00 Registration, Tea & Coffee

### Session 1 – Chair: Prof Frank Dinter

09h00 - 09h10	Session Introduction	Prof Frank Dinter
09h10 - 09h30	Thermal Resistance Model for CSP Central Receivers Plant	O de Meyer
09h30 - 09h50	Sun, Sand and Solar Power: An Overview of the Environmental Impact of Concentrating Solar Power in the Northern Cape, South Africa	J Rudman
09h50 - 10h10	Feasibility of Solar Thermal Process Heat for the Sugarcane Industry in South Africa	H Beukes
10h10 - 10h30	Packet Bed Thermal Energy Storage: Concepts and Costs	Dr K Allen
10h30 - 10h50	Determining the Pose Accuracy of a Drone in a CSP Plant Setting	J Lock

10h50 - 11h10 Tea & Coffee

### Session 2 – Chair: Prof Wikus van Niekerk

11h10 - 11h30	Annular Solar Receiving Tube	C van der Merwe
11h30 - 11h50	Development of a Dual-pressure Air Receiver for the SUNDISC Cycle: Initial finding on the HPAR Concept	L Heller
11h50 - 12h10	System Layout and Performance Prediction for a Solar-hybrid Micro-gas Turbine	B Ssebabi
12h10 - 12h30	Simulating the Effect of Solarisation on the Performance of a Gas Turbine	C Homann

12h30 - 13h30 Lunch

### Session 3 – Chair: Paul Gauché

13h30 - 13h50 A Top Down Approach to Heliostat Cost Reduction J Larmuth

13h50 - 14h10 Heliostat Field and Pod Placement S Bode

14h10 - 14h30 Using Single Variable Decomposition to Obtain Multi-dimensional Gaussian Flux Distributions for Optical Modelling of Heliostats Images W Landman

14h30 - 14h50 Stationary Booster Reflectors for Solar Thermal Process Heat Generation Dr S Hess

14h50 - Closure Tea & Coffee