# 2013 International Conference on the Industrial and Commercial Use of Energy

(ICUE 2013)

Cape Town, South Africa 20 – 21 August 2013



**IEEE Catalog Number: ISBN:** 

CFP1322R-POD 978-1-4799-0966-7

#### **Table of Contents**

**Surname, Title Initial** Firm, City, Country Co-Author

Paper Title PgNo

#### **Demand-Side Management**

Da Silva, I Makerere University Business School, Kampala

Batte, G

Entrepreneurial Capacity, Government Intervention and Diffusion of Technology in Uganda: Comparing the Supply side of Modern Energy and Mobile Telephony Technologies

1

Van Niekerk, W North-West University, Pretoria,

Kleingeld, Prof M; Booysen, W

The Value of Simulation Models When Implementing Mine DSM Projects

11

Mvudi, Y University of Johannesburg, Johannesburg

Pretorius, JHC

Influence of Water Pressure in the Evaluation of Energy Savings Achieved Through the use of Low Flow Shower Heads

15

## **Energy Management**

**Bolt, Dr G** North-West University, Pretoria

Van Rensburg, Dr J; Marais, Dr J

Practical Challenges Faced with Implementing a Dynamic Compressor Selection Program 21

**Dalgleish**, **B** North-West University, Potchefstroom

Grobler, Prof LJ; De Lange, Y; Ferreira, T

Benchmarking Buildings over 3-years with the National Energy Barometer Survey

29

**Du Plessis, J** North-West University, Pretoria

Prinsloo, I; Groenewald, H

Results from Implementing a Remote Diagnostic and Maintenance Solution on Energy Management Systems

35

Niesing, G SUNCYbernetics, Potchefstroom

Grobler, Prof LJ

Business Basics for Energy Efficiency – Using the Principles of Energy Management Combined with Renewable Energy to Achieve Sustainable Savings – a Case Study

41

Van Ginkel, O Vosloo, Dr J; Pelzer, Dr R	North-West University, Pretoria		
	for Industrial Energy Management	47	
Scheepers, C Bolt, Dr G; Kleingeld, Prof	North-West University, Pretoria		
	llenges in the Automation of a Water Transfer Pumping Stati	on 55	
Schoeman, W Oosthuizen, N; Van Rensbu			
Optimum Water Distribut	on Between Pumping Stations of Multiple Mine Shafts	59	
Swanepoel, R Bolt, Dr G; Pelzer, Dr R	North-West University, Pretoria		
	Energy Optimisation in Cement Production	63	
	s and Industry, Including Electric Moto	<u>)r</u>	
peration and Effici	<u>ency</u>		
Bester, J Le Roux, D; Adams, D	BBE Energy, Pretoria		
	d Air Pressure on Mining Production and Energy Demand	71	
Booysen, W Van Rensburg, Dr J; Kleing			
Load Management on Closed Loop Underground Fridge Plants and the Effects of Conditions			
		<i>7</i> 5	
Booysen, J Dekenah, M	Enerweb (Pty) Ltd, Johannesburg		
	Profile Subclasses for Distributions Network Planning	79	
Brand, H Bolt, Dr G; Pelzer, Dr R	North-West University, Pretoria		
	Model for Pollution Mitigation Through Energy Reduction Pro	ojects 87	
Cloete, S Le Roux, D; Bührmann, T	BBE Energy, Johannesburg		
	ir Wastage By Installing New Technology In Underground Mi	nes. 95	
<b>Dobzhanskyi, Dr O</b> Gouws, R	North West University, Potchefstroom		
Study on Energy Saving	Applying Highly Efficient Permanent Magnet Motor with Two reedom in Concrete Industry		

	<b>ozhanskyi, Dr O</b> Gouws, Dr R	North West University, Potchefstroom	
	Efficiency Analysis of a Ti Operated under Different	hree -Phase Power Transformer for Industry Applications Load Conditions	
			107
	<b>Dsen, P</b> Bolt, Dr G; Pelzer, Dr R	North-West University, Pretoria	
		ne Compressed Air Savings	113
	enewald, W Stols, A; Van Rensburg, Dr		
	The Value of Maintaining a	a DSM Load Shifting Project on Mine Dewatering Pumps	119
	<b>el, C</b> Joubert, R; Marais, Dr J	North-West University, Pretoria	
		Speed Drives on Electric Motor Operating Temperatures	123
	neschijn, R Vosloo, Dr J; Pelzer, Dr R	North-West University, Pretoria	
		oduction Scheduling Around Time-Varying Electricity Tariffs	129
	rais, J Kleingeld, Prof M; Van Rens Simplification of Mine Col		135
	nutte, AJ Mare, P; Kleingeld, Prof M Improved Utilisation and E Control of Auxiliary Syste	North-West University, Pretoria  Energy Performance of a Mine Cooling System Through the ems	143
	ı <b>lo, J</b> Sebitosi, Prof B	Stellenbosch University, Stellenbosch	
	Improving Energy Efficient	ncy In Malawian Tea Industries Using an Integrated Multi- ethod Combining IDA, DEA and Evolutionary Algorithms	149
Van	Tonder, K Kleingeld, Prof M; Marais, D Investigating Demand Res	North-West University, Pretoria or J sponse Potential on a Mining Group	157
	oen, C Ranasinghe, K Chilled Water Reduction o	BBE Energy, Johannesburg on an Underground Bulk Air Cooler System by Applying	
	Engineering Principles	272.0 272.0 272.0 272.0 272.0 272.0 272.0 272.0 272.0 272.0 272.0	163
	<b>ner, W</b> Vosloo, Dr J; Swanepoel, R	North-West University, Pretoria	
		Financial Feasibility of Low Grade Gold Ore Processing	169

# **Heating Ventilation and Air-Conditioning**

<b>Zhang, M</b> Huan, Prof Z	Tshwane University of Technology, Pretoria	
Experimental Setup of an	Air Source Heat Pump for Drying Banana Chips	177
Kamanzi, J Khan, Prof MTE	CPUT, Cape Town	
•	nology for a Cubesat Mobile Ground Station	183
Kivevele, T Huan, Prof Z; Fayose, Dr F		
Heat Pump Drying – A rev	view .	189
Maina, P Huan. Prof Z	Tshwane University of Technology, Pretoria	
· · ·	rmance of a CO2 Trans-Critical Water to Water Heat Pump	199
Van Eck, R Practical Guide for the In Savings	Waco Industries, Johannesburg  nplementation of Industrial & Commercial Hot Water Energy	205
Holman, A Van Rensburg, Dr J; Arndt, Benefits of Site Specific S Potential on Mine Cooling	Simulation Models for Assessing Electrical Energy Savings	211

# Climate Change, Environmental Issues and Clean Development Mechanisms

Colombert, Ms M Ecole des Ingenieurs de la Ville de Paris (EVIP), Paris

Nassopoulos, Dr H

Adaptatio project: Integration of adaptation to climate change within the design process of urban planning projects

### **Lighting**

**Uken, Prof E** CPUT, Cape Town

Bevan, G; Smith, R

LED Tube Retrofits for Fluorescent Lighting in Offices

219

#### **Energy Audits and M&V**

De Bod A; Grobler, Prof LJ

Barnard, F

Bashe, Ms M

Energy Efficiency Measures on Mine Pumping Systems – An M&V Methodology 231 De Jager, G North West University, Potchefstroom Grobler, Prof LJ How to Improve Efficiency on Analysing Big Data on a Large Number of Measurement and **Verification Projects** 239 De Villiers, p North-West University, Potchefstroom Grobler, Prof LJ Measurement and Verification Methodology for an Industrial Waste Heat Recovery Project in the Mining Industry 243 Storm, M North-West University, Potchefstroom Gouws, Dr R; Grobler, Prof LJ Measurement & Verification of the Eskom Irrigation Pumping Standard Product Program 249 **Energy Strategies** Dalgleish, B North-West University, Potchefstroom Gouws, Dr R Development of a Strategy and Plan for the Generation and use of Renewal Energy for the North West Province 257 Ramiith, P Enerweb (Pty) Ltd, Johannesburg Matshalaga, Ms D, Myeni, Dr S Automated instantaneous Monitoring of Customer Behaviour 263 Du Plessis, G North-West University, Pretoria Mathews, Prof EH; Vosloo, Dr J A Variable Water Flow Energy Efficiency Strategy for Mine Cooling Systems 269 Power Generation, Transmission and Distribution Anderson, Prof GO University of Botswana, Gaborone Karidza, C A case Study to Demonstrate Various Aspects of Voltage Stability on the Botswana Power System 279

Eskom Holdings SOC LTD, Johannesburg

Preview on Megaprojects Contingency Determination

North-West University, Potchefstroom

Heunis, Dr S Simulation Testing and I Network Planning Applic	Enerweb (Pty) Ltd, Johannesburg  mprovements to Network Load Modelling for a Distribution  ation	
		291
<b>Kasangala, F</b> Atkinson-Hope, Prof G	Centre for Power Systems Research, Cape Town	
	and Costs Evaluation of HVDC and UHVDC Transmission Lin	es 297
Lloyd, Prof P The External Cost of Pov		305
<b>Mushagala, MJ</b> Atkinson-Hope, Prof G	CPUT, Cape Town	
	ng Current Transmission Line Converted into a Direct Current	311
Onwaunta, O	CPUT, Cape Town	
Kahn, Prof MTE  Back to the Beginning TI	•	B#5
<b>Sibanda, M</b> Van Zyl, RR; Parus, N	CPUT, Cape Town	
	nagnetic Environment in the vicinity of HVDC Transmission Lin	nes 323
Van Willigenburg, P Woudstra, J; Stokman, H;		
DC meets Greenhouse H	orticulture: Improving Performance of HPS Lighting	331
<b>Woudstra, J</b> Groenewald B; Van Willige <i>Direct Current Distributio</i>	The Hague University of Applied Sciences, Delft enburg, P; Stokman, H; Willems, S; Van Oudheusden, A con Grids and the Road to its Full Potential	
		337
Renewable Energy	(Solar, Wind, Biogas, Hydro etc)	
Fritz, Dr W Embedded Generation a	CPUT, Cape Town nd its Effect on Utility Bottom Line	B#5
Hakimi-Khiabani, C Omar, I	CPUT, Cape Town	
	n Feasibility in Bulk Water Reticulation Pipelines	353
<b>Prange, J</b> Wilson, R	BBE Energy, Johannesburg	
Concentrated Solar Powersian Building and Commercia	er: What a South African Company has Learned from Designin lising a Linear Fresnel Concentrated Solar Thermal Power (CS	
Plant		357

# **Tariffs, Metering and Cost of Electricity**

Mbabazi, Ms R Makerere University, Kampala

Sebitosi, Prof B; Sansa-Otim, Dr J; Okou, Dr R

Uganda's Energy Sector: Challenges and Opportunities

369

Van der Zee, L North-West University, Pretoria

Pelzer, Dr R; Marais, Dr J

The Combined Cost Effect of Carbon Tax, ECS and MYPD3 Tariffs on the Gold Mining

**Industry of South Africa** 

375