

CURRICULUM VITAE

Willem Gabriel Le Roux

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION

Surname	Le Roux									
First names	Willem Gabriel				ID Number					
Citizenship	RSA (South Africa)				Title	Dr	Female	<input type="checkbox"/>	Male	<input checked="" type="checkbox"/>
Place of birth	Pretoria, RSA (South Africa)				Date of birth		1986/07/27			
Population group	African	<input type="checkbox"/>	Coloured	<input type="checkbox"/>	Indian	<input type="checkbox"/>	White	<input checked="" type="checkbox"/>	Other (Please specify)	
Department	Mechanical and Aeronautical Engineering				Position		Senior Lecturer			
Direct Telephone	012 420 2446				Direct Telefax					
E-mail	willem.leroux@up.ac.za									
Date of appointment	2015/05/01				Permanent full-time		<input checked="" type="checkbox"/>	Temporary full-time		<input type="checkbox"/>

1.2 ACADEMIC QUALIFICATIONS OBTAINED

Degree/ Diploma	Field of study	Higher education institution	Year	Distinctions
BEng	Mechanical Engineering	University of Pretoria, South Africa	2008	First Class
BEng (Hons)	Mechanical Engineering	University of Pretoria, South Africa	2009	Distinction
MEng	Mechanical Engineering <i>Thesis: Maximum net power output from an integrated design of a small-scale open and direct solar thermal Brayton cycle</i>	University of Pretoria, South Africa	2011	Distinction
PhD	Mechanical Engineering <i>Thesis: Thermodynamic optimisation and experimental collector of a dish-mounted small-scale solar thermal Brayton cycle</i>	University of Pretoria, South Africa	2014 (Graduated: April 2015)	Not Applicable

1.3 PROFESSIONAL REGISTRATION				
Pr Eng	Professional Registration as Professional Engineer	ECSA (Engineering Council of South Africa)	2016	Registration number: 20160368

1.4 NRF RATING			
Y2	Rated researcher	National Research Foundation (NRF)	February 2017

1.5 ACADEMIC WORK EXPERIENCE TO DATE		
Name of employer	Capacity and/or type of work	Period
University of Pretoria, Department of Mechanical and Aeronautical Engineering	Teaching Assistant and Research Engineer (Thermodynamics and Heat Transfer)	2009 - 2014
University of Pretoria, Department of Mechanical and Aeronautical Engineering	PhD Research Engineer	2012 - 2014
University of Pretoria, Department of Mechanical and Aeronautical Engineering	Lecturer	2015/01/01 - 2015/04/30
University of Pretoria, Department of Mechanical and Aeronautical Engineering	Senior Lecturer	2015/05/01 - current

1.6 INDUSTRY WORK EXPERIENCE TO DATE		
Name of employer	Capacity and/or type of work	Period
Koeberg Nuclear Power Plant	Trainee Mechanical Engineer as a PBMR (Pebble Med Modular Reactor) bursary holder	2007/01
Saspine	Trainee Mechanical Engineer in Bio-Medical Engineering	2007/11 - 2007/12
Helder Energie (Pty) Ltd.	Director <ul style="list-style-type: none"> - Renewable energy systems, - Solar tracking systems 	2013 - 2017
EPCM Holdings	Part-time consulting <ul style="list-style-type: none"> - Stirling cooler, water bath heater, CO₂ capture projects 	2017, 2019
SolarGolfer (Pty) Ltd.	Director <ul style="list-style-type: none"> - Renewable energy systems, - Solar electric vehicles 	2017 - current

2. TEACHING ACTIVITIES

2.1 Courses presented		
Course	Level	Self developed (Yes or No)
Thermoflow (Heat Transfer) (MTV410) <ul style="list-style-type: none"> - Senior Lecturer - 2015-current - 300+ students per semester - Co-lecturer: Prof JP Meyer - Module Coordinator 	4 th (final) year	Yes
Thermodynamics (MTX311) <ul style="list-style-type: none"> - Senior Lecturer - 2017-current - 300-400 students per semester - Co-lecturer: Dr AS Lexmond - Module Coordinator 	3 rd year	Yes
Thermodynamics (MTX221) <ul style="list-style-type: none"> - Senior Lecturer - 2016-2019 - 500-700 students per semester - Co-lecturers: Prof J Dirker, Dr M Moghimi-Ardekani, Ms B Huysen 	2 nd year	No

2.2 Supervisor of self-developed final (4 th) year projects	
Course	Topics supervised
Final year project (MRN410 & MRN420) <ul style="list-style-type: none"> - 2015-current - 10-20 students per year 	<ul style="list-style-type: none"> • Solar water desalination/purification • High-temperature solar air receiver • Thermoelectric generator • Solar hydrogen generator • Micro-turbine test rig for Brayton cycle • Solar thermal heat storage • Solar thermal fuel production/alcohol distillery • Micro-turbine recuperator testing • Cogeneration from solar Brayton cycle • Vacuum-membrane solar dish • Stirling cooler component testing
Final year design (MOX410 & MOX420) <ul style="list-style-type: none"> - 2015-current - 10-20 students per year 	<ul style="list-style-type: none"> • Dish-mounted hybrid solar thermal Brayton cycle • Dish-mounted solar thermal Rankine cycle • Thermal renewable energy systems for hotel • Thermal energy storage for solar power plant • Gas heater for a swimming pool • Domestic hot water heat pump

2.3 Other education and pedagogic courses presented		
Course	Level	Institution
Stand-in lecturer for lectures in: <ul style="list-style-type: none"> - Thermodynamics (MTX311) - Thermodynamics (MTX221) - Thermal and Fluid Machines (MTV420) 	3 rd year (2011) 2 nd year (2014) 4 th year (2015)	University of Pretoria
Vacation work (MPY310, MPY410) <ul style="list-style-type: none"> - Supervisor and Project Manager - 65+ students 	3 rd and 4 th year (2012-current)	University of Pretoria
Advanced Thermodynamics and Energy Systems (MTX781) <ul style="list-style-type: none"> - Module Coordinator - Lecturers: Prof A Bejan, Prof S Lorente, Dr AS Lexmond 	Postgraduate level (2015-current)	University of Pretoria
Engineering Professionalism (IPI410) <ul style="list-style-type: none"> - Guest Lecturer: Competency Standard for Registration as a Professional Engineer 	4 th year (2018-2019)	University of Pretoria

3. RESEARCH ACTIVITIES

3.1 Former supervision or co-supervision (completed)				
Name of student	Degree/Title of dissertation/ thesis and date	Supervisor	Co-supervisor(s)	Duration of studies (years)
JK Swanepoel	MEng: Helically coiled cavity receiver for a micro-scale direct generation steam Rankine cycle using a novel solar dish design, 2020	WG le Roux AS Lexmond	JP Meyer	1
KE Dellar	MEng: Clamped plate-style recuperator for a small-scale solar thermal Brayton cycle using high-temperature sealant, 2020	WG le Roux	JP Meyer	1

3.2 Current post-graduate students					
Name of student	Degree enrolled for	Project title	Supervisor	Co-supervisor(s)	Year of registration
TM Wolff	MEng	Initial testing of a collector for a solar-dish Brayton cycle	WG le Roux	JP Meyer	2017
C Roosendaal	BEng (Hons)	Analysis of novel solar concentrator using lunar flux mapping techniques	WG le Roux		2019
J Buys	BEng (Hons)	High-temperature testing of an open-cavity tubular solar receiver for a solar-dish Brayton cycle	WG le Roux		2019
T Phakisi	BEng (Hons)	Geospatial analysis for the implementability of the solar-dish Brayton cycle in South Africa	WG le Roux	JP Meyer	2019
H de Beer	BEng (Hons)	Cooling window for a solar-dish Brayton cycle	WG le Roux	JP Meyer	2020

3.3 Obtaining research funds (Optional)			
Origin of research funds (e.g. contract research, THRIP, international funding organisations, other(s))	Title of research project or programme	Duration	Money allocated (R) (Optional - exact amounts not required)
Innovate UK, Energy Catalyst Round 7: Mid Stage	SolarTurbo-CHP, Semi-renewable, grid independent micro combined heat and power system	2 years	R 4,641,980 (£ 233,500)
The Royal Society - Newton Mobility Grant	Power generation for African rural communities: initial assessment of high temperature thermal energy storage for small scale solar Brayton system	12 months	R 54,563.61 (£ 2,997.55)
Technology Innovation Agency (TIA)	Solar thermal Brayton cycle development: Personal micro-turbine	12 months	R 650,000
Technology Innovation Agency (TIA)	Solar thermal Brayton cycle development	18 months	R 500,000
Research and Development Program (RDP), UP	Testing of a small-scale dish-mounted solar thermal Brayton cycle	3 years	R 50,000 per year
NRF Incentive Funding for Y-Rated Researcher	Solar thermal Brayton cycle research and development	1 year	R 30,000

4. RESEARCH OUTPUTS

4.1 Publications in peer-reviewed or refereed journals

1. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Operating conditions of an open and direct solar thermal Brayton cycle with optimised cavity receiver and recuperator, *Energy* 36: 6027-6036, **2011**.
2. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Thermodynamic optimization of an integrated design of a small-scale solar thermal Brayton cycle, *International Journal of Energy Research* 36: 1088-1104, **2012**.
3. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Optimum performance of the small-scale open and direct solar thermal Brayton cycle at various environmental conditions and constraints, *Energy* 46: 42-50, **2012**.
4. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; A review on the thermodynamic optimisation and modelling of the solar thermal Brayton cycle, *Renewable & Sustainable Energy Reviews* 28: 677-690, **2013**.
5. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; The efficiency of an open-cavity tubular solar receiver for a small-scale solar thermal Brayton cycle, *Energy Conversion and Management* 84: 457-470, **2014**.
6. LE ROUX WG; Optimum tilt and azimuth angles for fixed solar collectors in South Africa using measured data, *Renewable Energy* 96: 603-612, **2016**.
7. LONI R, KASAEIAN AB, ASKARI ASLI-ARDEH E, GHOBADIAN B and LE ROUX WG; Performance study of a solar-assisted organic Rankine cycle using a dish-mounted rectangular-cavity tubular solar receiver, *Applied Thermal Engineering* 108: 1298-1309, **2016**.
8. PAVLOVIC S, BELLOS E, LE ROUX WG, STEFANOVIC V and TZIVANIDIS C; Experimental investigation and parametric analysis of a solar thermal dish collector with spiral absorber, *Applied Thermal Engineering* 121: 126-135, **2017**.

9. LONI R, ASKARI ASLI-ARDEH E, GHOBADIAN B, BELLOS E and LE ROUX WG; Numerical comparison of a solar dish concentrator with different cavity receivers and working fluids, ***Journal of Cleaner Production*** 198: 1013-1030, **2018**.
10. LE ROUX WG and SWANEPOEL PJ; Analysis of a novel rotating disk cylinder engine concept for power generation, ***International Journal of Energy Research*** 43(1): 580-588, **2019**.
11. LONI R, NAJAFI G, ASKARI ASLI-ARDEH E, GHOBADIAN B, LE ROUX WG and YUSAF T; Performance investigation of solar ORC using different nanofluids, ***Applied Sciences (Switzerland)*** 9: 3048, **2019**.
12. LE ROUX WG and SCIACOVELLI A; Recuperated solar-dish Brayton cycle using turbocharger and short-term thermal storage, ***Solar Energy*** 194: 569-580, **2019**.
13. DELLAR KE, LE ROUX WG and MEYER JP; Plate-style recuperator for a solar Brayton cycle using high-temperature sealant, ***Applied Thermal Engineering*** (accepted on 3 May, **2020**).
14. ROOSENDAAL C, SWANEPOEL JK and LE ROUX WG; Performance analysis of a novel solar concentrator using lunar flux mapping techniques, ***Solar Energy*** (accepted on 18 May, **2020**).

4.2 Books and/or chapters in books

1. LE ROUX WG, MEYER JP; Clean Energy for Sustainable Development, 1st Edition: Comparisons and Contrasts of New Approaches, Chapter 6 (Small-scale Dish-Mounted Solar Thermal Brayton Cycle), pp. 167–190, (Paperback ISBN: 9780128054239, eBook ISBN: 9780128054246, ***Elsevier***: London, **2017**).

4.3 Published full-length conference papers (peer-reviewed)

1. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Optimum performance of the small-scale open and direct solar thermal Brayton cycle at various environmental conditions and constraints, International Green Energy Conference-VI (***IGEC-VI***), Eskisehir, Turkey, 5-9 June, 2011.
2. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Optimum operating conditions of the small-scale open and direct solar thermal Brayton cycle at various steady state conditions, 8th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (***HEFAT2011***), Mauritius, 11-13 July, 2011.

3. LE ROUX WG, BELLO-OCHEENDE T and MEYER JP; Maximum net power output of the recuperative open and direct solar thermal Brayton cycle, ASME 2011 5th International Conference on Energy Sustainability (**ES2011**), Washington, 7-10 August, 2011.
4. LE ROUX WG, BELLO-OCHEENDE T and MEYER JP; Optimum small-scale open and direct solar thermal Brayton cycle for Pretoria, South Africa. 1st Southern African Solar Energy Conference (**SASEC2012**), Stellenbosch, 21-23 May, 2012.
5. LE ROUX WG, BELLO-OCHEENDE T and MEYER JP, Optimum small-scale open and direct solar thermal Brayton cycle for Pretoria, South Africa. ASME 2012, Paper No. ES2012-91135, pp. 1225-1234. 6th International Conference on Energy Sustainability (**ES2012**), San Diego, California, 23-26 July, 2012.
6. LE ROUX WG, MWESIGYE A, BELLO-OCHEENDE T and MEYER JP; Tracker and collector for an experimental setup of a small-scale solar thermal Brayton cycle. 2nd Southern African Solar Energy Conference (**SASEC2014**), Port-Elizabeth, South Africa, 27-29 January, 2014.
7. LE ROUX WG, BELLO-OCHEENDE T and MEYER JP; Optimisation of an open rectangular cavity receiver and recuperator used in a small-scale solar thermal Brayton cycle with thermal losses, 10th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (**HEFAT2014**), Orlando, Florida, 14-16 July, 2014.
8. MWESIGYE A, LE ROUX WG, BELLO-OCHEENDE T and MEYER JP; Thermal and thermodynamic analysis of a parabolic trough receiver at different concentration ratios and rim angles, 10th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (**HEFAT2014**), Orlando, Florida, 14-16 July, 2014.
9. LE ROUX WG, MEYER JP and BELLO-OCHEENDE T; Experimental testing of a tubular cavity receiver for a small-scale solar thermal Brayton cycle, 3rd Southern African Solar Energy Conference (**SASEC2015**), Kruger National Park, South Africa, 11-13 May, 2015.
10. CRAIG KJ, LE ROUX WG and MEYER JP; Computational fluid dynamics analysis of parabolic dish tubular cavity receiver, 3rd Southern African Solar Energy Conference (**SASEC2015**), Kruger National Park, South Africa, 11-13 May, 2015.
11. LE ROUX, WG and MEYER JP; Modeling the small-scale dish-mounted solar thermal Brayton

cycle, AIP Conference Proceedings 1734, 060002-1–060002-8; doi: 10.1063/1.4949144 (**SolarPACES2015**), Cape Town, 13-16 October, 2015.

12. LE ROUX, WG; High-temperature testing of an open-cavity tubular solar receiver, 4th Southern African Solar Energy Conference (**SASEC2016**), Stellenbosch, 31 October - 2 November, 2016.
13. SMITH JD and LE ROUX WG; Small-scale fuel production using a solar-dish distillation system, 5th Southern African Solar Energy Conference (**SASEC2018**), Durban, 25-27 June, 2018.
14. WOLFF TM, LE ROUX WG and MEYER JP; Analysis of a parabolic dish solar collector via lunar flux mapping, 5th Southern African Solar Energy Conference (**SASEC2018**), Durban, 25-27 June, 2018.
15. DELLAR K, LE ROUX WG and MEYER JP; Small-scale solar thermal Brayton cycle recuperator: Experimental testing and heat loss analysis, 5th Southern African Solar Energy Conference (**SASEC2018**), Durban, 25-27 June, 2018.
16. LE ROUX WG; Feasibility study of a hybrid small-scale dish-mounted solar thermal Brayton cycle with cogeneration, 16th International Heat Transfer Conference (**IHTC-16**), Beijing, China, 10-15 August, 2018.
17. WOLFF TM, LE ROUX WG and MEYER JP; Heat loss analysis for an open-cavity tubular solar receiver, 16th International Heat Transfer Conference (**IHTC-16**), Beijing, China, 10-15 August, 2018.
18. DELLAR K, LE ROUX WG and MEYER JP; Experimental testing of a small-scale solar thermal Brayton cycle recuperator, 16th International Heat Transfer Conference (**IHTC-16**), Beijing, China, 10-15 August, 2018.
19. CICINELLI B, WOLFF TM, DELLAR KE, LE ROUX WG, SCIACOVELLI A; Power generation for African rural communities: initial assessment of high temperature thermal energy storage for small-scale solar Brayton system, International Conference on Applied Energy (**ICAE2019**), Västerås, Sweden, 12-15 August, 2019.

4.4 Keynote Conference papers

1. MEYER JP, LE ROUX WG and BELLO-OCHEDE T; The micro-turbine: a solar-to-electricity solution, International Conference on Clean Energy for Sustainable Growth in Developing Countries (**CESGDC'15**), Palapye, Botswana, 16-18 September, 2015.
2. LE ROUX WG; Recuperated solar-dish Brayton cycle, 10th Renewable Energy Postgraduate Symposium & **6th STERG Symposium**, Stellenbosch, South Africa, 17-19 July, 2019.

4.5 Conference papers (non-refereed)

1. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Minimization and optimum distribution of entropy generation for maximum net power output of the small-scale open and direct solar thermal Brayton cycle, First Postgraduate Renewable Energy Symposium, Lynedoch, Cape Town, 11-12 November, 2010.
2. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Optimisation of the receiver and recuperator of the small-scale open and direct solar thermal Brayton cycle for Pretoria, Second Postgraduate Renewable Energy Symposium, Lynedoch, Cape Town, 17-18 November, 2011.
3. LE ROUX WG, BELLO-OCHEDE T and MEYER JP; Solar tracking for a parabolic dish used in a solar thermal Brayton cycle, Third Postgraduate Renewable Energy Symposium, Lynedoch, Cape Town, 22-23 November, 2012.

4.6 Patents

1. LE ROUX WG, DELLAR KE, South African Patent Application No. 2019/03915 in the name of UNIVERSITY OF PRETORIA - "Recuperator".

4.7 Technical reports

1. LE ROUX WG, LEXMOND AS; Development of a Stirling cooler. Client: EPCM Consultants South Africa, 2017.
2. LE ROUX WG, LEXMOND AS; Feasibility study on a CO₂ extraction process. Client: EPCM Consultants South Africa, 2017.

5. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

5.1 Participation in conferences, workshops and short courses - specify type of contribution

- Event speaker at DAAD (German Academic Exchange Service) - Engineering Research in the Renewable Energy Field, German South African Research Lecture Series: 'Energy Sciences': LE ROUX WG, MEYER JP, and BELLO-OCHEDE T; Solar thermal power generation using the Brayton cycle, Tshwane University of Technology, Pretoria, 10 April 2013.
- Delegate and University of Pretoria representative at the Annual National Renewable and Sustainable Energy Postgraduate Symposia (REPS2016-2017, 2019) and Solar Thermal Energy Research Group Symposium (STERG Symposium 2017, 2019) and STERG Technical Tour of Solar Power Plants in the Northern Cape (2017).

5.2 Teamwork and collaboration with others:

- Dr Adriano Sciacovelli: University of Birmingham (UK) collaboration. Power generation for African rural communities: initial assessment of high temperature thermal energy storage for small-scale solar Brayton system (The Royal Society - Newton Mobility Grant).
- External examiners from industry (Professional Mechanical Engineers): Final year design and research projects (University of Pretoria)
- Co-lecturers: Prof JP Meyer, Prof J Dirker, Dr M Mehrabi, Dr AS Lexmond, Ms B Huysen, Dr Moghimi Ardekani (University of Pretoria)
- Dr AS Lexmond: Consultation work for EPCM Holdings.
- Mr MG Kotze (Chartered Accountant): Management of Helder Energie (Pty) Ltd. and SolarGolfer (Pty) Ltd. activities.

5.3 Membership in national and international bodies

- Professional Member of the International Solar Energy Society (ISES) (since 2019/11/01)

5.4 Visits to local and overseas universities or research institutes as researcher

- University of Birmingham (UK), December 2018 (Newton Mobility Grant).

6 MANAGEMENT AND ADMINISTRATIVE DUTIES

- Director: Helder Energie (Pty) Ltd. (2013-2017)
- Director: SolarGolfer (Pty) Ltd. (2017-current)
- Project Manager: Consultation work; Client: EPCM Consultants South Africa (2017)
- Principal Investigator (2015-current) and Project Manager (2012-current): Small-scale dish-mounted solar thermal Brayton cycle project: University of Pretoria
- Supervisor: Final year design and research projects: University of Pretoria (2015-current)
- Supervisor: Master's students: University of Pretoria (2017-current)
- Module coordinator: University of Pretoria: Thermoflow (2015-current), Thermodynamics (2017-current) and Advanced Thermodynamics and Energy Systems (2015-current)
- Committee Member: SAURAUN (Southern African Universities Radiometric Network): Monitoring of solar measuring station (2013-current)
- Marketing committee member: Department of Mechanical and Aeronautical Engineering (2016-2017)

7 COMMUNITY SERVICE OR PROFESSIONAL SKILLS

7.1 Referee duties

Designated Reviewer for Journals:

- Applied Energy, 2015, 2018.
- Renewable Energy, 2016-2017, 2019.
- Solar Energy, 2018-2019.

Designated Reviewer for Conferences:

- HEFAT (International Conference on Heat Transfer, Fluid Flow and Thermodynamics), 2011-2014.
- SASEC (Southern African Solar Energy Conference), 2015, 2018-2019.
- SolarPACES, 2015.
- IHTC (International Heat Transfer Conference), 2018.

External examiner:

- Master's Thesis, University of Cape Town (2017)
- Master's Thesis, University of Stellenbosch (2019)
- Master's Thesis, University of KwaZulu-Natal (2019)
- PhD Thesis, University of Stellenbosch (2019)

7.2 Workshop and installations

- Construction of solar thermal test facility: University of Pretoria, Engineering Building 2 Roof.
- Volunteer for installation of the SOLYS2 SAURAN measuring station: University of Pretoria.

7.3 Licenses

- Motor vehicle, Motorcycle

7.4 Software skills

- SolidWorks, Matlab, Flownex, SolTrace, MSOffice

8 AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

8.1 Evaluation status as scientist/scholar

Rated Y2-researcher by the South African National Research Foundation (NRF), February 2017.

8.2 Research awards and prizes

- Outstanding paper award for the best paper in the session: LE ROUX WG, BELLO-OCHENDE T and MEYER JP; Optimum performance of the small-scale open and direct solar thermal Brayton cycle at various environmental conditions and constraints, International Green Energy Conference-VI (IGEC-VI), Eskisehir, Turkey, 5-9 June, 2011.
- Outstanding paper award for the best paper in the session on "Solar Energy 1": LE ROUX WG, BELLO-OCHENDE T and MEYER JP; Optimisation of an open rectangular cavity receiver and recuperator used in a small-scale solar thermal Brayton cycle with thermal losses, 10th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT2014), Orlando, Florida, 14-16 July, 2014.
- Outstanding paper award for the best paper in the session on "Solar Thermal (Heat Transfer and Fluid Mechanics)": LE ROUX WG, MEYER JP and BELLO-OCHENDE T; Experimental testing of a tubular cavity receiver for a small-scale solar thermal Brayton cycle, 3rd Southern African Solar Energy Conference (SASEC2015), Kruger National Park, South Africa, 11-13 May, 2015.

9. PERSONAL INTERESTS AND OTHER

9.1 Music: Percussionist; Drummer; Backing vocalist; Bass guitarist; Live performances

9.2 Outdoors: Hiking; Mountain biking; Tennis; Traveling

9.3 Languages: Afrikaans; English; Sepedi / Northern Sotho (limited); Dutch (limited)

9.4 Matric: 9 Distinctions