



DR. PATRICK U. AKPAN'S CURRICULUM VITAE



Contact: Department of Mechanical Engineering, University of Nigeria.

Email: Patrick.akpan@unn.edu.ng

T: +2348102475639

Research gate: https://www.researchgate.net/profile/Patrick_Akpan

Google Scholar ID: <https://scholar.google.com/citations?user=2Mm-sJ8AAAAJ&hl=en>

ORCID ID: orcid.org/0000-0001-7250-5591

Date of Birth: 14 April 1983

Sex: M

Nationality: Nigerian

Marital Status: Married

No of Children: 3



LIST OF CONTENTS

LIST OF CONTENTS.....	1
1. Brief Bio	2
2. Professional Experience.....	3
➤ Teaching & Tutorship Experience	3
➤ Research experience and Interest	3
➤ Industrial/Project Experience	4
➤ Supervisory Experience	5
➤ Laboratory Experience.....	6
➤ Engineering Software & Programming Experience	7
➤ Administrative/Leadership/Service Experience	8
3. Scholarly Works	9
➤ Book Publication	9
➤ Peer reviewed Journal Article Publications	9
➤ Peer reviewed Conference Paper Publications	10
➤ Academic Thesis	11
➤ Book of Abstract Publications.....	11
➤ Manuscripts under review for Journal Publication	12
➤ Manuscripts under preparation for Journal Submission	12
4. Educational Qualifications	13
5. Awards, Scholarships & Grants.....	13
6. Continuous Professional Development	13
7. Membership of Professional Bodies.....	16
8. References	17

1. Brief Bio

Dr. Patrick U. Akpan is an expert in the design, modelling and thermal performance evaluation of renewable & conventional energy & power Systems. He is also an expert in Energy System integration, audit, management, and deployment. He has a PhD in Mechanical Engineering (specializing in Power Plant Engineering) from the University of Cape Town, an MSc in Process Systems Engineering (specializing in Energy Systems and Thermal processes) from Cranfield University United Kingdom and a Bachelor's degree in Mechanical Engineering from the University of Nigeria.

Akpan's experience and interests have been fostered by twelve years (2008-2020) of independent and collaborative research and development projects, academic project supervisions, and undergraduate teaching and mentoring at various organizations in Nigeria, South Africa, and the United Kingdom. The organizations are: University of Nigeria (UNN), University of Cape Town, Cranfield University, Bentley Motors in Crewe UK, and Eskom Power Holdings in South Africa.

Dr. Akpan has co-authored eighteen (18) scholarly publications and five (5) manuscripts that are currently under review in top engineering journals. He also reviews papers for Scientific and Engineering Journals such as Energy Conversion and Management, Energy, Nijotech, and etc. He has gained proficiency in the use of different engineering softwares in his previous and current research projects. These include: Python, Ansys Fluent, Matlab, Wanda Transient, Excel, System Advisor Model, Virtual Plant etc. His spoken and written English language skills are good.

Dr. Akpan has received a number of awards namely:

- African Energy Indaba Top Innovator Award 2017
- Eskom Energy Efficiency Doctoral Bursary Award 2016-2018
- TWAS-NRF Doctoral Fellowship Award 2016-2018
- NNPC/ESSO Exploration Foreign Post- Graduate Scholarship 2010-2011
- Exxon Mobil Producing Nigeria Limited Undergraduate Scholarship 2002-2006

His previous and present membership of professional bodies include: African Renewable Energy Alliance (AREA), Council for the Regulation of Engineering in Nigeria (COREN Membership No: R50714), American Society of Mechanical Engineers (ASME Membership No: 100122279), Energy Institute in UK (Membership No: 42673) and South African National Energy Association (SANEA).

2. Professional Experience

➤ Teaching & Tutorship Experience

- **Lecturer I (2014-2016; 2019-2020)**, University of Nigeria, Nsukka
 - Conduct research in Energy and Power systems and publish/present relevant findings in peer reviewed journals and conferences.
 - Supervise research projects conducted by students.
 - Teach, mentor and examine graduate and undergraduate students in various mechanical engineering courses such as Energy management, Measurement and Instrumentation, Fluid Power Engineering, and Mechanical Engineering laboratory.
 - Offer academic advice to graduate & undergraduate students.
 - Serve as the department's time table coordinator.
 - Organize and facilitate interaction/meetings between the department and the industry specialist.

- **MEC 1000W Tutor (2017- 2018)**, University of Cape Town
 - Taught first year undergraduates on how to write a technical report.
 - Mentored the students on a village Energy project.
 - Graded some assignments.

- **Lecturer II (2011-2014)**, University of Nigeria, Nsukka
 - Conducted research in Energy and power related systems and publish/present relevant findings in peer reviewed journals and conferences.
 - Supervised research projects conducted by undergraduate students.
 - Taught, mentored, and examined undergraduate students in various mechanical engineering courses such as Measurement and Instrumentation, Heat and Mass transfer and Mechanical Engineering Laboratory.
 - Offered academic advice to Undergraduates.

- **Graduate Assistant (2008-2011)**, University of Nigeria, Nsukka
 - Coordinated laboratory experiments for undergraduates on determination of overall heat transfer coefficient of a concentric tube heat exchanger in both parallel and counter flow modes and determination of thermal conductivity ratios of three metals.
 - Graded exam scripts and
 - Worked as an Examination Officer for first and second year students.

➤ Research experience and Interest

My research experiences and interests are mainly within the field of Energy and Power Engineering and Thermo-fluids engineering. I have been involved in a number of researches by way of my MSc thesis, undergraduate projects supervision, collaborative and independent studies.

- **Power Plant Modelling and Simulation:** Process systems and thermodynamic cycle optimization of Thermal power plants.
- **Renewable energy technologies and policy:** Biomass, Biofuels and Solar thermal and PV systems.
- **CFD Modelling and Simulation:** NO_x emissions prediction, Fluid flow analysis etc.
- **Thermal analysis of energy systems:** Energy and Exergy analysis of Energy Systems.
- **Hydraulics of Fluid flow:** Pressure Surge analysis (rigid column and water hammer analysis) in water pipelines.
- **Waste Heat Utilization technologies:** Organic Rankine Cycle and Thermoelectric Generators.

➤ Industrial/Project Experience

- **Eskom Research & Development PhD Project (February 2016 – December 2019):** Examined the impact of Integrating Renewable systems on the performance of the conventional Coal fired Power Plants. Developed a novel Variable Turbine Cycle Heat Rate (V-TCHR) approach, for predicting the part load thermal performance of different Coal Fired Power Plant (CFPP) architectures, without detail knowledge of the entire steam cycle parameters. Investigated the impact of including the V-TCHR model in Renewable grid integrated CO₂ emissions impact study.
- **Eskom Operational Flexibility Project (Nov 9-14 2017): Matla Power Station Unit 3.** Participated in a Tier 2/3 exploration testing led by EPRI and MPR Associates to improve the existing minimum load and identify changes to reduce the minimum load. Attended technical meetings with Engineering/Operations/Maintenance, I& C personnel. Reviewed heat balance diagrams and some plant drawings.
- **Eskom Operational Flexibility Project (Nov 2-7 2017): Tutuka Power station Unit 4.** Participated in a Tier 2/3 exploration testing led by EPRI and MPR Associates to improve the existing minimum load and identify changes to reduce the minimum load. Attended technical meetings with Engineering/Operations/Maintenance, I& C personnel. Conducted plant walk down, Collected O₂ & CO samples at the economizer outlet, collected water chemistry samples from the Condensate water polishing plant (CPP). Reviewed heat balance diagrams and some plant drawings.
- **MSc Group Project (2011) Bentley Motors, Crewe in United Kingdom** Worked with a team of four students to undertake an Energy Audit on the main boiler house in the factory. Recommended areas of improvement in terms of energy management.
- **Internship (2005) Ekong and Sons limited. Nigeria**
Undertook a six month internship training on Automobile HVAC systems.

➤ Supervisory Experience

Some of the undergraduate research projects completed/on-going under the supervision of Dr. Akpan are listed below:

S/No	Students	Project Title	Year /Duration	Status
1	Chukwu, C and Nwafor, B.	<i>A Renewable Energy System Design using System Advisor Model (SAM)</i>	2019-2020	On-going
2	Adieme, P. S. & Ifediora, C	<i>Design of A Water Distribution Network (WDN)</i>	2019-2020	On-going
3	Akpan, U. & Ogbozor, A. C.	<i>Varying load performance evaluation of thermal Power Plants</i>	2019-2020	On-going
4	Dike, S. & Egah, F. H.	<i>Design of an HVAC System for NLNG Building</i>	2019-2020	On-going
5	Ujam, C. & Onwuso, S.	<i>Reactivation of a radiative and natural convection apparatus</i>	2015-2016	Completed
6	Ejeh, J. & Awaka, H.	<i>Design of a Water Distribution Network for Onitsha</i>	2015-2016	Completed
7	Aso, L., & Okeudo, U.	<i>Design of a solar PV system for mechanical engineering department</i>	2015-2016	Completed
8	Nsionu, G.	<i>Performance Evaluation of Some Local Methods used in kerosene fired oven for baking cakes</i>	2014-2015	Completed
9	Peter, C & Okafor, C	<i>Performance Evaluation of a Charcoal Fired Oil Palm fruit Boiler</i>	2014-2015	Completed

S/No	Students	Project Title	Year /Duration	Status
10	Omeife, M	<i>Biogas generation potentials of Nsukka metropolis from biodegradable components of municipal solid waste (MSW)</i>	2013-2014	Completed
11	Onyishi, H & Asogwa, I	<i>Experimental Investigation of a 112KW Diesel Engine Test Bed</i>	2011-2012	Completed
12	Akpan, E. G.	<i>The Potential of Orange Oil with Diethyl Ether (DEE) as an alternative fuel for CI engines.</i>	2011-2012	Completed

➤ Laboratory Experience

Dr. Akpan has been privileged to work in different laboratories at the department of Mechanical Engineering, University of Nigeria at different times. A summary of his experiences in these laboratories are presented below:

- **Heat Engines and Thermodynamics Laboratory**, University of Nigeria, Nsukka
 - i. **Natural Convection and Radiation Apparatus (2014 - 2016)**, supervised undergraduate student projects on the determination of the emissivity of a cylindrical rod and natural convection investigation in a hollow cylindrical enclosure.
 - ii. **Basic and Industrial Refrigeration System Training Simulators (2012 - 2016)**, demonstrated the working principle of basic and industrial refrigeration systems to undergraduates offering a course in Refrigeration and Air conditioning.
 - iii. **Basic and Industrial Air conditioning System Training Simulators (2012 - 2016)**, demonstrated the working principle of basic and industrial Air conditioning systems to undergraduates offering a course in Refrigeration and Air conditioning.
 - iv. **Internal Combustion (Spark Ignition and Compression Ignition) Engine Test bed (2012 - 2016)**, conducted experiments on a four stroke, four cylinder Spark Ignition

Engine test bed and a four stroke, four cylinder compression ignition engine test bed.

- v. **Double Tube Heat Exchanger Apparatus (2008 -2010)**, conducted laboratories for undergraduates on determination of overall heat transfer coefficient of a concentric tube heat exchanger in both parallel and counter flow modes.
- vi. **Thermal Conductivity Apparatus (2008 -2010)**, conducted experiments for the determination of thermal conductivity ratios of three metals using a hot plate and a thermocouple.
- **Measurement and Instrumentation Laboratory**, University of Nigeria, Nsukka
Arduino Based Measurement Systems (2015-2016): As part of the measurement and instrumentation course (ME 343) that I teach at the undergraduate level, I demonstrate how an Arduino based measurement can be built. I also advise and evaluate a mini-design group project that is executed by the students in the course.
- **Mechanics of Machines Laboratory (2012 –2016)** University of Nigeria, Nsukka
Co-ordinate the activities of this Laboratory. Trained and worked with laboratory staff on the use of Wall Jib Crane Apparatus, Belt Friction (V and Flat belt) Apparatus, Simple Screw Jack Apparatus, Simple and Compound Pendulum Apparatus, Reaction of Beam Apparatus.

➤ Engineering Software & Programming Experience

Dr. Akpan has gained proficiency in the use of the underlisted softwares in my previous and current research works.

- **Python** programming for Data Science.
- **EtaPro's Virtual Plant** was used for part of his PhD research on steady state performance evaluation of a Coal fired Power Plant.
- **Mathcad** was used for part of his PhD research bothering on PC Boilers Performance evaluation.
- **Matlab** was used for the numerical simulation of the model proposed in his MSc research and is currently being used for a study on Modelling and simulation of transient thermal behaviour of a stone walled cottage.
- **SolidWorks** for computer aided designs, Part modelling, Assembly of Parts, and 2D Engineering drawings.
- **Ansys Fluent** was used for the modelling and simulation studies on NOx emissions prediction in a turbulent diffusive flame, water flow in a Venturi meter, and Transient simulation of a metal cooling process.
- **Wanda Transient** was used in his MSc research for modelling and simulating the hydraulics of fluid flow in water pipelines.
- **XYscan** was used for extracting experimental and numerical data (plotted as graph) for validating the results of the numerical model that He proposed in his MSc research.

- **Microsoft Excel** for engineering computation and data analysis.
- **System Advisor Model** is a performance and financial model for renewable power systems (Photovoltaic, Solar water heating, Concentrating Solar Power, Geothermal, Biomass and Wind) and projects. It was developed by National Renewable Energy Laboratory (NREL).

➤ Administrative/Leadership/Service Experience

- **Member**, Academic Linkage/Collaborations, Faculty of Engineering, University of Nigeria, (August 2020 -Till Date).
- **Member**, Time Table Committee, Faculty of Engineering, University of Nigeria, (August 2020 -Till Date).
- **Dean's Representative**, DTLC Committee of Electrical Engineering Department, University of Nigeria, (August 2020 -Till Date).
- **Chairman**, Digital Learning Committee, Department of Mechanical Engineering, University of Nigeria, (August 2020 -Till Date).
- **Member**, Conference Planning Committee, Department of Mechanical Engineering, University of Nigeria, (July 2020 -Till Date).
- **Secretary**, SEITC 2020 Conference Publicity sub-committee, Faculty of Engineering, University of Nigeria, Nsukka (Nov 2019 – July 2020).
- **Time-table Coordinator**, Department of Mechanical Engineering, University of Nigeria (2019 – till date).
- **Thermac Student Adviser**, Department of Mechanical Engineering, University of Nigeria (2019 – till date).
- **Secretary**, Renewable and Alternative Energy (RAE) Research Group, Department of Mechanical Engineering, University of Nigeria (2014 – 2016).
- **Reviewer (2013- Date)**, Offer professional review of engineering papers for reputable peer reviewed journals like: Energy Conversion and Management (ECM), Nigerian Journal of Technology (NIJOTECH), Ains San Engineering, and others.
- **Course Representative**, MSc Process Systems Engineering. Cranfield University, UK. 2010-2011.
- **Student Representative of Faculty of Engineering**, Information Systems Committee, Cranfield University, UK. 2010-2011.
- **Examination Officer**, Department of Mechanical Engineering, University of Nigeria, Nsukka (2008-2010).
- **Resident Market Director (May 2008 – August 2008)**, Nigerian Bottling Company: Responsible for marketing and distributing Coca-Cola products in Okota region of Lagos state, Nigeria, responsible for business development, recruited and managed sales personnel, presented weekly sales report to my line supervisor.
- **Corps Liaison Officer**, National Youth Service Corps (Izzi LGA in Ebonyi State) 2007-2008.
- **Academic Coordinator**, Christian Union Fellowship. (2002/2003 Session).

- **Library Prefect**, Gideon Comprehensive High School, Okota Isolo, Lagos State. Nigeria (1999/2000).

3. Scholarly Works

➤ Book Publication

1. Mgbemene, C. A., Okoye, U. O., and **Akpan, P. U.** (2018). A practical guide to academic project/research work for Engineering, Physical Sciences, Social Sciences and Education Students. *University of Nigeria Press*, Nsukka.

➤ Peer reviewed Journal Article Publications

2. **Akpan, P. U.** and Fuls, W. F. (2020). Cycling of Coal fired Power Plants: A generic V-TCHR based CO₂ emissions factor model for predicting CO₂ emissions. Accepted for publication in *Energy*.
3. **Akpan, P. U.** and Fuls, W. F. (2019). Application and limits of a constant effectiveness model for predicting the pressure of steam condensers at varying loads. *Applied Thermal Engineering* 158 (2019) 113779.
4. **Akpan, P. U.**, Mgbemene, C. A., Ume, J. I., Jones, S., and Yeung, H (2019). Constant Heat Outflow Rates for Air/Surge Vessel Modelling During Pressure Transients. *International Journal of Pressure Vessels and Piping* 172 (2019), 295-303.
5. **Akpan, P. U.** and Fuls, W. F. (2018) Generic method for estimating final feed water temperature and extraction pressures in Coal fired power plants. *Applied Thermal Engineering* (141), pp. 257-268.
6. Eke, M. N., Onyejekwe, D. C., Iloeje, O. C., Ezekwe, C. I. and **Akpan, P. U.** (2018) Energy and Exergy Evaluation of a 220 MW thermal Power Plant. *Nijotech. Vol. 37, Issue, 01, pp.115-123, 2018.*
7. **Akpan, P. U.**, Jones, S., Yeung, H. and Eke, M. N. (2017) Modelling and transient simulation of water flow in pipelines using Wanda transient software. *Ains Engineering Journal. Vol. 8, Issue, 03, pp.457-466, 2017.*

➤ Peer reviewed Conference Paper Publications

8. **Akpan, P. U.** and Fuls, W. F (2020). A novel V-TCHR model for predicting the turbine cycle heat rate response of coal fired power plants at different loads. *Proceedings of the 2020 Sustainable Engineering and Industrial Technology Conference (SEITC)*, held at the Faculty of Engineering, UNN, Enugu State, 06- 08th July, 2020.
9. **Akpan, P. U.** and Fuls, W. F. (2020). Methodology for developing and validating representative process models for Coal fired power plants. *Proceedings of the 2020 Sustainable Engineering and Industrial Technology Conference (SEITC)*, held at the Faculty of Engineering, UNN, Enugu State, 06- 08th July, 2020.
10. Onyishi, H.O., Asogwa, I., & **Akpan, P.U.** (2020). Performance evaluation of a four cylinder, four stroke 112 KW compression ignition Engine. *Proceedings of the 2020 Sustainable Engineering and Industrial Technology Conference (SEITC)*, held at the Faculty of Engineering, UNN, Enugu State, 06- 08th July, 2020.
11. **Akpan, P. U.** Egeonu, C. V., and Okoye, O. C. (2016). A global assessment of nanotechnology activities part 1: a look at publications. *The 2nd Nanotechnology Conference/Workshop on Applications of Nanotechnology to Energy, Environment, and Health* held at University of Nigeria, Nsukka. 4th – 7th July, 2016.
12. **Akpan, P. U.** Egeonu, C. V., and Okoye, O. C. (2016). A global assessment of nanotechnology activities part 2: a look at patents. *The 2nd Nanotechnology Conference/Workshop on Applications of Nanotechnology to Energy, Environment, and Health* held at University of Nigeria, Nsukka. 4th – 7th July, 2016.
13. **Akpan, P. U.**, Omeife M. A., Onyishi, H. O., Okoye, O. (2015). Biogas Production from Biodegradable Component of Municipal Solid Waste in Nsukka Metropolis. Presented at *International Conference on Electrical Power Engineering (ICEPENG)* held in UNN, Enugu, Nigeria, and October 14-16. 2015. pp. 236-241. DOI: 10.13140/RG.2.1.4310.3448
14. **Akpan P. U.** (2014), Nanotechnology Status in Africa (1995-2011): A Scientometric Assessment. Presented at *1st African International Conference/Workshop on Applications of Nanotechnology to Energy, Health and Environment*. Nsukka, Enugu State, Nigeria. March 23-29, 2014. pp. 202-210. DOI: 10.13140/RG.2.1.4781.3608
15. **Akpan, P. U.**, Akpan, E. G., and Ozor, P. A. (2014). An Estimation of Orange Oil (Bio-Diesel) Quantity from Orange Peels In Nigeria. A Paper presented at *NIIE 2014 International Conference* held at Awka (UNIZIK) Nigeria. October 23–25, 2014. Conference Theme: Waste to Wealth in national Transformation. pp. 138-146. DOI: 10.13140/RG.2.1.3796.2721
16. **Akpan, P. U.** and Akubue, G. U. (2014). Nigeria’s Renewable Energy: A Case for Hydropower. A Paper presented at *NIIE 2014 International Conference* held at Awka (UNIZIK) Nigeria. October 23 –25, 2014. Conference Theme: Waste to Wealth in national Transformation. pp. 93-109. DOI: 10.13140/RG.2.1.2682.1602

➤ Academic Thesis

17. **Akpan, P. U.** (2019) Impact on heat rate and subsequent emissions due to varying operations of coal fired power plants, PhD Thesis at University of Cape Town, South Africa. Supervised by A/Prof Wim Fuls.
18. **Akpan, P. U.** (2011) Improved mathematical model of Air Vessels, MSc Thesis at Cranfield University, United Kingdom. Supervised by Prof. Hoi Yeung and Sarah Jones.

➤ Book of Abstract Publications

1. Agbo, C. O., **Akpan, P. U.**, Njoku, H. O., and Mgbemene, C. A. (2019). Empirical design and performance evaluation of a mini-generator acoustic enclosure. Presented at the 2019 *Biennial Conference on Emerging Cross-Disciplinary Education and Research for Sustainable Development: The Role of General Studies Programme*, held at the University of Nigeria, Nsukka. 6th -9th May, 2019.
2. **Akpan, P. U.** and Fuls, W. F. (2018). A V-TCHR model for predicting the turbine cycle heat rate response of coal fired power plants at different loads. *SAIMechE Conference Proceedings on Mechanical, Manufacturing, Materials and Biomedical Engineering*. Held on 9th November, 2018. SARETEC, Cape Town, South Africa. PP. 3-4.
3. **Akpan, P. U.** and Fuls, W. F. (2018). Application and limits of a constant effectiveness model for predicting the pressure of steam condensers at varying loads. *SAIMechE Conference Proceedings on Mechanical, Manufacturing, Materials and Biomedical Engineering*. Held on 9th November, 2018. SARETEC, Cape Town, South Africa. PP. 5-6.
4. **Akpan, P. U.** and Fuls, W. F. (2017). Understanding heat rate and emissions of coal fired plants operating due to renewable energy power generation induced cycling. *Sustainable Development of South Africa's Energy Sources Conference Proceedings*. 29 – 30 Nov 2017, Glenhove Conference Centre. PP. 64-66.
5. **Akpan, P. U.** and Fuls, W. F. (2017). Generic method for estimating final feed water temperature and extraction pressures in Coal fired power plants. *SAIMechE Conference Proceedings on Mechanical, Manufacturing and Materials Engineering*. Held on 3rd November, 2017. STIA Wallenberg Centre, Stellenbosch, South Africa. PP. 1-2.
6. **Akpan, P. U.** and Fuls, W. F. (2017). An Approach for estimating extraction pressures in subcritical Coal Fired Power Plants. *4th EBE Postgraduate Research Expo* Held on 25th May, 2017. University of Cape Town South Africa.
7. **Akpan, P. U.** and Fuls, W. F. (2016). Impact of grid integrated renewable induced coal fired plant cycling on heat rate and emissions. *SAIMechE Conference on Mechanical, Manufacturing and Materials Engineering*. Held on 4th November, 2016. The River Club, Observatory, Cape Town, South Africa.

➤ Manuscripts under review for Journal Publication

1. Ozoegwu, C. G. and **Akpan, P. U.** Solar Energy Policy Directions for Safer and Cleaner Development in Nigeria. Under review at *Energy Policy Journal*. Manuscript No: JEPO-S-20-02151.
2. Ozoegwu, C. G. and **Akpan, P. U.** A Comparative Use of Neural Networks, Bayesian and Classical Regressions for Predicting Wind Speed from Ground-Level Weather Data: Implications for a Crowd-Driven Wind Energy Penetration. Under review at *Journal of Cleaner Environmental System*. Manuscript No: CESYS-D-20-00019.
3. Ozoegwu, C. G. and **Akpan, P. U.** A Review and Appraisal of Nigeria's Solar Energy Policy Objectives and Strategies against the Backdrop of the Renewable Energy Policy of the Economic Community of West African States. Under review at *Renewable and Sustainable Energy Reviews*. Manuscript No. RSER-S-20-06066.
4. Agbo, C. O. A., Onyechi, P. C., and **Akpan, P. U.** A natural convective passive noise control system for mini generators. Under review at *Ains Engineering Journal*. Manuscript No: ASEJ-D-15-00517R1.

➤ Manuscripts under preparation for Journal Submission

1. **Akpan, P. U.** and Fuls, W. F. Fleetwide CO₂ emissions investigation of power system networks with varying levels of renewable power penetration.
2. **Akpan, P. U.** and Fuls, W. F. Cycling of fossil based Plants: A convenient method for predicting low load heat rates for accurate emissions reduction modelling.
3. **Akpan, P. U.** and Fuls, W. F. Development of representative process models for investigating the thermal performance of coal fired power plants at varying load.
4. Osaretin, M. O., Edelugo S. O., **Akpan, P.U.** and Agbo C.O.A. Load-displacement behaviour of Pre-cracked composites laminates from Polyester resin reinforced with E-glass fibre.
5. Osaretin, M. O., Edelugo S. O., **Akpan, P.U.** and Agbo C.O.A. Stress Intensity Factor Determination of E-glass fibre reinforced polyester composite.

4. Educational Qualifications

- **PhD , Mechanical Engineering** (Power Plant Engineering Option)
University of Cape Town, **2020**.
- **MSc, Process Systems Engineering** (Energy systems and Thermal Processes Option)
Cranfield University, United Kingdom. **2012**.
- **B.Eng., Mechanical Engineering** (Energy and Power Option).
University of Nigeria, Nsukka. **2006**.
- **West African Senior School Certificate Examination (WASSCE)**
Gideon Comprehensive High School, Lagos state. **2000**.
- **First School leaving Certificate (F.S.L.C)**
Gideon International Children School, Lagos state. **1994**

5. Awards, Scholarships & Grants

- UCT International Conference Travel GrantRn2 Award 2018
- Overall Best Student Oral Presentation Award from Fossil Fuel Foundation 2017
- UCT local Conference Travel GrantRn2 Award 2017
- African Energy Indaba Top Innovator Award 2017
- Eskom Energy Efficiency Doctoral Bursary Award 2016- 2018
- TWAS-NRF Doctoral Fellowship Award 2016- 2018
- Elsevier Certificate of Reviewing for Energy Conversion and Management 2015
- THERMAC Best Young Mechanical Engineering Lecturer Award 2014
- THERMAC Most Influential Young Mechanical Engineering Lecturer Award 2012
- NNPC/ESSO Exploration Foreign Post- Graduate Scholarship 2010-2011
- Exxon Mobil Producing Nigeria Limited Undergraduate Scholarship 2002-2006
- Cowbell Annual Lagos state all Secondary Schools Mathematics Merit Award 2000

6. Continuous Professional Development

Dr. Akpan has participated in a number of Workshops, Symposiums, Exhibitions, Short courses, Trainings and Conferences. A chronological list is presented below:

1. **Training in Scientific Computing and Python for Data Science Applied Data Science Module: Unit I.** WorldQuant University. 13th April - 20th June 2020.
2. **2020 Sustainable Engineering and Industrial Technology Conference (SEITC)**, held at the University of Nigeria, Enugu State, 6 -11 July 2020.

3. **2019 Biennial Conference on Emerging Cross-Disciplinary Education and Research for Sustainable Development: The Role of General Studies Programme**, held at the University of Nigeria, Nsukka. 6th - 9th May, 2019.
4. **SAIMechE Conference on Mechanical, Manufacturing, Materials and Biomedical Engineering**, held at SARETEC, Cape Town, South Africa, 9th November 2018.
5. **Sisakest Engineering Training**. Participated in a two weeks (31st May – 18th June 2018), intensive training programme on the use of **SolidWorks 2014 version**. The training covered important aspects of Solidworks Part modelling, Solidworks Assembly of Parts, and Solidworks 2D Engineering drawings.
6. **Sustainable Development of South Africa's Energy Sources Conference** held at the Glenhove Conference Centre, South Africa, 29 – 30 November 2017.
7. **Power Plant visit to Koeberg Nuclear Power Station**. A plant walk down was carried out at the power station on 12th October, 2017. Koeberg, South Africa.
8. **Research Symposium co-hosted by the CSIR** and the Institute for Advanced Sustainability Studies, Germany. Assessing Co-benefits of Renewable Energy in South Africa. 2-3 October, 2017. Lynwood conference centre, Pretoria, South Africa.
9. **Fourth Eskom Power Plant Engineering Institute Student Workshop**. 29 - 30 May 2017. Eskom Academy of Learning, Dale Road, Midrand, South Africa.
10. **4th Engineering and Built Environment (EBE) Research Expo**, University of Cape Town. 25th May, 2017.
11. **African Utility Week**, held at Cape Town International Conference Centre, South Africa. 16-18 May, 2017.
12. **African Energy Indaba Exhibition**. Held at Sandton Convention Centre, South Africa. February 21-22, 2017.
13. **South African National Energy Association (SANEA) lecture Series** "Concentrated Solar Power (CSP)-Dispatchable Renewable. 16th November 2016, Cape Town. Presented by: Nandu Bhula, Deputy Director, ACWA Power Southern Africa.
14. **SAIMechE Conference on Mechanical, Manufacturing and Materials Engineering**, held at the River Club, Observatory, Cape Town, South Africa, 4th November 2016.
15. **South African National Energy Association (SANEA) lecture Series** "2016 PwC African Oil and Gas Review: The Choice for change" Presented by Chris Bredenhann, Energy Industry Leader for PwC in Southern Africa & the PwC Africa Advisory Oil & Gas Leader. 21st September, Cape Town. Presented by Chris Bredenhann Energy Industry Leader for PwC in Southern Africa & the PwC Africa Advisory Oil & Gas Leader.
16. **Third Eskom Power Plant Engineering Institute Student Workshop**. 11 - 12 July 2016. Eskom Academy of Learning, Dale Road, Midrand, South Africa.

17. ***The 2nd Nanotechnology Conference/Workshop on Applications of Nanotechnology to Energy, Environment, and Health*** held at University of Nigeria, Nsukka, and 4th – 7th July, 2016.
18. ***Power Plant Visit to Camden Power Station***. A guided tour was given for the boiler House. 6th June, 2016. Mpumalanga, South Africa.
19. ***South African National Energy Association (SANEA) Knowledge Exchange Session: Knowledge Exchange with an Indian Power Sector Delegation. University of Cape Town***. 20th May, 2016.
20. ***1st LATEX introductory Academy*** held at Department of Mechanical Engineering, University of Nigeria, and Nsukka Campus. 19th -21st October, 2015.
21. ***International Conference on Electrical Power Engineering (ICEPENG)*** held in UNN, Enugu, Nigeria, October 14-16. 2015.
22. ***Training on the use of Science, Engineering and Technology (SET) Laboratory/Workshop*** Equipment in the area of Refrigeration and Air-conditioning held at Gregory University Uturu, Abia State Nigeria. 18th -29th May, 2015.
23. ***Workshop on Grid Computing User Applications for Academics and Research Communities***, held on 8th July, 2014 at the MTN Connect, Nnamdi Azikiwe Library, University of Nigeria, and Nsukka.
24. ***NIIE 2014 International Conference*** held at Awka (UNIZIK) Nigeria. October 23–25, 2014. Conference Theme: Waste to Wealth in national Transformation.
25. ***1st African International Conference/Workshop on Applications of Nanotechnology to Energy, Health and Environment***. Nsukka, Enugu State, Nigeria. March 23-29, 2014
26. ***Sustainability live Exhibition and Conference*** held at NEC Birmingham, United Kingdom. May, 2011.
27. ***All-Energy 2011 Exhibition and Conference*** held in Aberdeen, Scotland. May, 2011.
28. ***Training on Application of Microsoft Excel for Data Analysis and Computations*** held at ICT Centre Cranfield University, United Kingdom. March 2011.
29. ***ETF- Research Methodology Capacity Building workshop on Engineering and Technology*** held at Federal University of Technology, Owerri. 26-30 April, 2010.

7. Membership of Professional Bodies

- **Member:** African Renewable Energy Alliance (AREA)
- **Member:** Council for the Regulation of Engineering in Nigeria (COREN). (Membership number: R50714).
- **Affiliate Member.** South African National Energy Association (SANEA). (Membership number: STO003) 2016
- **Member.** American Society of Mechanical Engineers (Membership No: 100122279) 2011
- **Member.** Energy Institute UK (Membership No: 42673) 2010

8. References

Dr. C. A. Mgbemene

Associate Dean, Faculty of Engineering
Senior Lecturer, Department of Mechanical Engineering
University of Nigeria, Nigeria.
Cell: +234 803 426 3781
Email: chigbo.mgbemene@unn.edu.ng



Dr. Pieter Rousseau

Professor, Department of Mechanical Engineering
University of Cape Town, South Africa.
UCT: +27 (0) 21 650 5822
Cell: +27 (0) 82 452 9290
Email: pieter.rousseau@uct.ac.za



Dr. Wilhelm F. Fuls

Associate Professor, Department of Mechanical Engineering
University of Cape Town, South Africa.
Cell: +27 (0)83 417 7494
UCT: +27 (0)21 650 2600
Email: wim.fuls@uct.ac.za



Engr. John Clarke

System Engineer, Turbine Engineering
Tutuka Power Station, South Africa.
Tel: +27 17 749 5670
Cell: +27 (0)78 802 8147
Email: clarkJS@eskom.co.za

