Francis Boafo Effah

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RESEARCH

Interests	Power Electronics Power Converters Renewable Energy Systems
Areas	Electrical and Electronic Engineering · Control and Systems Engineering · Artificial Intelligence · Renewable Energy, Sustainability and the Environment · Automotive Engineering · Energy Engineering and Power Technology

RESEARCH SUMMARY

78	556	10	13	2.01	16%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 78 publications listed below, 2012–2026. Field-weighted impact is the mean over the 58 works scored for it; 1.00 is the world average for works of the same field, type and year. 9 of the 58 papers scored for it are among the world's most cited tenth for their field, type and year.

POSITIONS

Senior Lecturer 2021–present
Electrical & Electronic Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Lecturer 2015–2016
Electrical and Electronic Engineering, University of Mines and Technology, Tarkwa, Ghana

Research Fellow 2014–2015
Electrical and Electronic Engineering, University of Nottingham, Nottingham, United Kingdom

EDUCATION AND QUALIFICATIONS

PhD Electrical & Electronic Engineering 2008–2014
Electrical & Electronic Engineering, University of Nottingham, Nottingham, United Kingdom

BSc Electrical/Electronic Engineering 1997–2001
Electrical & Electronic Engineering, Kwame Nkrumah University of Science and Technology College of Engineering, Kumasi, Ghana

DISTINCTIONS, MEMBERSHIPS AND SERVICE

Professional Engineer 2018–present
Ghana Institution of Engineering, Accra, Ghana

Senior Member 2013–present
IEEE, New York, United States

PUBLICATIONS

Journal articles 64

1. Eldad Appiah, Yaw Opoku Mensah Sekyere, **Francis Boafo Effah** (2026). A multi-stage congestion management strategy in deregulated power markets using generator rescheduling and demand-side interventions. *Energy Reports*. https://doi.org/10.1016/j.egyr.2025.108952
2. Kofi Addo Annan, Emmanuel Assuming Frimpong, **Francis Boafo Effah**, Elvis Twumasi, Abdul-Majid Issah Malori, Mark Ampomah Otu (2026). An Improved Electromagnetism-like Algorithm for Gaussian Process Hyperparameter Optimization in Remaining Useful Life Prediction of Electrolytic Capacitors. *Electrical Engineering and Energy (ELENE)*. https://doi.org/10.64470/elene.2026.35
3. Abena Sarpomaa Appiah, Daniel Kwegyir, **Francis Boafo Effah**, Daniel Opoku, Peter Asigri, Emmanuel Kwaku Anto, Nana Maryam Abdul-Bassit Munagah, Kelvin Worlanyo Tamakloe (2026). An improved Pelican Optimization Algorithm with velocity effect. *Journal of Electrical Systems and Information Technology*. https://doi.org/10.1186/s43067-026-00356-8
4. Samuel Dodobatia Wetajega, Godwin K. Ayetor, Sani Moussa Kadri, Richard Opoku, **Francis B. Effah**, Philipp Rosner, Charles K. Sekyere (2026). Assessing the technical readiness of Ghana's distribution grid for electric vehicle integration: A case study revealing transformer overload and harmonic violations. *Results in Engineering*. https://doi.org/10.1016/j.rineng.2026.110922
5. Peter Asigri, Emmanuel Frimpong, Daniel Opoku, Daniel Kwegyir, Yaw Opoku Mensah Sekyere, **Francis Boafo Effah** (2026). Combined optimal power flow and profit maximization in the power sector using an enhanced multi-objective grey wolf optimizer. *Journal of Electrical Systems and Information Technology*. https://doi.org/10.1186/s43067-026-00350-0
6. Kofi Addo Annan, **Francis Boafo Effah**, Emmanuel Asuming Frimpong (2026). Development of encoder-multivariate time-series transformer for remaining useful life prediction of IGBTs. *Journal of Electrical Systems and Information Technology*. https://doi.org/10.1186/s43067-026-00368-4
7. Abdul-Majid Issah Malori, Emmanuel Asuming Frimpong, **Francis Effah Boafo**, Elvis Twumasi, Peter Asigri, Bernard Marfo Adjei (2026). End to end prediction of optimal power flow in sustainable power system using physics-informed spatiotemporal graph neural network. *Electrical Engineering and Energy (ELENE)*. https://doi.org/10.64470/elene.2026.33
8. Flavio Odoi-Yorke, Richard Opoku, Charles K.K. Sekyere, **Francis Boafo Effah** (2026). Phase change materials for cold energy storage: Insights from three decades of research trends, advancements, and future directions. *Energy Exploration & Exploitation*. https://doi.org/10.1177/01445987261422506
9. Elvis Tamakloe, Benjamin Kommey, Jerry John Kponyo, Daniel Opoku, **Francis Boafo Effah** (2026). Remaining Useful Lifetime Prediction of Distribution Transformer Using Dynamic Multi-Scale Attention-based CNN-LSTM. *Andalas Journal of Electrical and Electronic Engineering Technology*. https://doi.org/10.25077/ajeeet.v6i1.210
10. Yaw Opoku Mensah Sekyere, Priscilla Ajiboye Oyelandun, **Francis Boafo Effah** (2026). Security Challenges and Solutions in Self-Driving Vehicles: A Comprehensive Review. *IET Intelligent Transport Systems*. https://doi.org/10.1049/itr2.70237
11. Abdul-Majid Issah Malori, Emmanuel Asuming Frimpong, **Francis Boafo Effah**, Elvis Twumasi, Peter Asigri, Bernard Marfo Adjei (2026). Warm-starting conventional solver for ACOPF prediction using Modified Seagull Optimization Algorithm and physics-informed spatiotemporal graph neural network. *Electrical Engineering and Energy (ELENE)*. https://doi.org/10.64470/elene.2026.34
12. Bright K. Banzie, **Francis B. Effah**, John K. Annan (2025). A High-Gain, High-Bandwidth, Bidirectional Discrete GaN-Based SyncFET dv/dt Sensor for MHz Power Converters. *Power Electronics and Drives*. https://doi.org/10.2478/pead-2025-0025
13. Bright K. Banzie, John K. Annan, **Francis B. Effah** (2025). A new discrete GaN-based dv/dt control circuit for megahertz frequency power converters. *e-Prime - Advances in Electrical Engineering Electronics and Energy*. https://doi.org/10.1016/j.prime.2025.100917

14. Joshua Churchill Ankrah, **Francis Boafo Effah**, Elvis Twumasi (2025). An Enhanced Semisteady-State Jaya Algorithm With a Control Coefficient and a Self-Adaptive Multipopulation Strategy. *Journal of Electrical and Computer Engineering*. https://doi.org/10.1155/jece/3036909

15. **FB Effah** (2025). Constrained MIMO Reference-Based Offline Steady–State (RBOSS) NMPC for PMSM using Voltage Source Inverter. *JOURNAL OF APPLIED RESEARCH IN ELECTRICAL ENGINEERING*. https://www.sid.ir/paper/1862926/en

16. Sulayman Kujabi, Emmanuel Asuming Frimpong, **Francis Boafo Effah** (2025). ENHANCING ISLANDING DETECTION IN PV-BASED DISTRIBUTED SYSTEMS USING CEEMDAN AND PATTERN RECOGNITION NEURAL NETWORK. *Carpathian Journal of Electrical Engineering*. https://doi.org/10.34302/cjee/lrbt6157

17. Sulayman Kujabi, Emmanuel Asuming Frimpong, **Francis Boafo Effah** (2025). Energy-Efficient Islanding Detection Using CEEMDAN and Neural Network Integration in Photovoltaic Distribution System. *International Journal of Energetica*. https://doi.org/10.47238/ijeca.v9i2.240

18. Yaw O. M. Sekyere, **Francis B. Effah**, Philip Y. Okyere (2025). Fractional order ANFIS controllers for LFC in RES integrated three-area power system. *Journal of Electrical Systems and Information Technology*. https://doi.org/10.1186/s43067-025-00200-5

19. **FB Effah** (2025). Journal of Applied Research in Electrical Engineering. *J. Appl. Res. Electr. Eng*. https://jaree.scu.ac.ir/article_20300_6710ad47901fc717935bc4c6aa9fe736.pdf

20. Dominic Adu-Buabeng, Yaw Opoku Mensah Sekyere, **Francis Boafo Effah** (2025). Natural Exponential Inertia Weight and Acceleration Coefficient Particle Swarm Optimization Algorithm tuned PID Controller for DC Motor Speed Control. *Jurnal Nasional Teknik Elektro*. https://doi.org/10.25077/jnte.v14n3.1401.2025

21. Kobena Badu Enyam, Desmond Hammond, **Francis Boafo Effah**, Lily Akosua Kyei-Baffour, Benecentia Mafo-Kwofie (2025). Noise-Adaptive SOGI–HOSM Observer for Sensorless Speed Control of Induction Machines. *Journal of Electrical and Computer Engineering*. https://doi.org/10.1155/jece/7211823

22. Yaw Opoku Mensah Sekyere, Priscilla Oyeladun Ajiboye, **Francis Boafo Effah**, Bernard Tawiah Opoku (2025). Optimizing PID control for automatic voltage regulators using ADIWACO PSO. *Scientific African*. https://doi.org/10.1016/j.sciaf.2025.e02562

23. Emmanuel K. Effah, **Francis B. Effah**, Philip Y. Okyere, Emmanuel K. Anto (2025). Robust Adaptive Control of Dual Active Bridge DC-DC Converter with Constant Power Loading. *Power Electronics and Drives*. https://doi.org/10.2478/pead-2025-0004

24. Flavio Odoi-Yorke, Bismark Baah, Robert Kissi-Boateng, Richard Opoku, **Francis Boafo Effah** (2025). Unlocking the potential of redundant energy from solar photovoltaic systems: Navigating global research trends, innovations, and future directions. *Energy Reports*. https://doi.org/10.1016/j.egyr.2025.05.072

25. Yaw Opoku Mensah Sekyere, **Francis Boafo Effah**, Philip Yaw Okyere (2024). A Novel ANFIS Controller for LFC in RES Integrated Three-Area Power System. *Journal of Electronics and Electrical Engineering*. https://doi.org/10.37256/jeee.3220244886

26. Yaw O. M. Sekyere, **Francis B. Effah**, Philip Y. Okyere (2024). An Enhanced Particle Swarm Optimization Algorithm via Adaptive Dynamic Inertia Weight and Acceleration Coefficients. *Journal of Electronics and Electrical Engineering*. https://doi.org/10.37256/jeee.3120243868

27. Kobena Badu Enyam, **Francis Boafo Effah**, Desmond Hammond (2024). An Improved SOGI-Higher-Order Sliding Mode Observer-Based Induction Motor Speed Estimation. *Power Electronics and Drives*. https://doi.org/10.2478/pead-2025-0002

28. D Kwegyir, **FB Effah**, P Asigri (2024). Analysis of the Potential of Different Air Conditioner Brands for Piezoelectric Energy Harvesting. *Journal of Applied Research in Electrical Engineering*. https://jaree.scu.ac.ir/article_19120.html

29. Peter Asigri, Emmanuel Asuming Frimpong, Emmanuel Kwaku Anto, Daniel Kwegyir, **Francis Boafo Effah** (2024). Enhanced Multi-Objective Grey Wolf Optimization using Adaptive Diversity Tuning and Levy Flights. *Carpathian Journal of Electrical Engineering*. https://doi.org/10.34302/cjee/tkyd3692

30. Akwasi Adu-Poku, Ebenezer K. Siabi, Nathaniel Oppong Otchere, **Francis B. Effah**, Edward A. Awafo,

Francis Kemausuor, Mashael Yazdanie (2024). Impact of drought on hydropower generation in the Volta River basin and future projections under different climate and development pathways. *Energy and Climate Change*. https://doi.org/10.1016/j.egycc.2024.100169

31. Daniel Kwegyir, Michael Dugbartey Terkper, **Francis Boafo Effah**, Emmanuel Kwaku Anto, Stacy Gyamfuah Lumor (2024). Improved Driving Training-Based Optimization Algorithm Using Levy Flight and Crowding Distance Techniques. *Research Reports on Computer Science*. https://doi.org/10.37256/rrcs.3120244384
32. Shadrack T. Asiedu, Frank K.A. Nyarko, Samuel Boahen, **Francis B. Effah**, Benjamin A. Asaaga (2024). Machine learning forecasting of solar PV production using single and hybrid models over different time horizons. *Heliyon*. https://doi.org/10.1016/j.heliyon.2024.e28898
33. Emmanuel K. Effah, Emmanuel K. Anto, Philip Y. Okyere, **Francis B. Effah** (2024). Model Reference Adaptive Control of SPS-Based Dual Active Bridge Converter with Constant Power Loading. *Power Electronics and Drives*. https://doi.org/10.2478/pead-2024-0022
34. Yaw O. M. Sekyere, **Francis B. Effah**, Philip Y. Okyere (2024). Optimal Tuning of PID Controllers for LFC in Renewable Energy Source Integrated Power Systems Using an Improved PSO. *Journal of Electronics and Electrical Engineering*. https://doi.org/10.37256/jeee.3120243869
35. Yaw O. M. Sekyere, **Francis B. Effah**, Philip Y. Okyere (2024). Optimally tuned cascaded FOPI-FOPIDN with improved PSO for load frequency control in interconnected power systems with RES. *Journal of Electrical Systems and Information Technology*. https://doi.org/10.1186/s43067-024-00149-x
36. **FB Effah**, D Kwegyir, EA Frimpong (2023). ANN-based electricity theft classification technique for limited data distribution systems. *Jurnal Nasional Teknik Elektro*. https://jnte.ft.unand.ac.id/index.php/jnte/article/view/1072
37. P Asigri, D Kwegyir, **FB Effah** (2023). Design and Implementation of a Low-Cost Combined Cooling and Tracking Solar PV System. *ADRRI Journal of Engineering and Technology*. https://scholar.google.com/scholar?cluster=7669627171540263 64&hl=en&oi=scholarr
38. Yaw Opoku Mensah Sekyere, **Francis Boafo Effah**, Philip Yaw Okyere (2023). Hyperbolic Tangent - Based Adaptive Inertia Weight Particle Swarm Optimization. *Jurnal Nasional Teknik Elektro*. https://doi.org/10.25077/jnte.v12n2.1095.2023
39. **FB Effah**, EA Frimpong (2023). OPTIMIZING DUTY RATIOS IN A GRID-INTERACTIVE INVERTER: A FIVE-LEVEL, THREE-LEG, THREE-PHASE CASCADED HBRIDGE APPROACH EMPLOYING MPCC WITH AN EXPLICIT INTEGRATION ALGORITHM. *Carpathian Journal of Electrical Engineering*. https://search.proquest.com/openview/f472f3f1f803f1536bd339ef7fcca298/1?pq-origsite=gscholar&cbl=2048965
40. **Francis Boafo Effah**, Daniel Kwegyir, Daniel Opoku, Peter Asigri, Emmanuel Asuming Frimpong (2023). Short-Term EV Charging Demand Forecast with Feedforward Artificial Neural Network. *Jurnal Nasional Teknik Elektro*. https://doi.org/10.25077/jnte.v12n2.1094.2023
41. Peter Asigri, **Francis Boafo Effah**, Daniel Opoku, Daniel Kwegyir, Anthony Kweku Eshun, Britney Asantewaa Owiredu, Mourad Bin Shafiyu, Sagoe De-Roy Ekow (2023). Technical Performance of Grid-Connected Rooftop Solar PVs. *International Journal of Energetica*. https://doi.org/10.47238/ijeca.v8i2.223
42. **FB Effah**, PY Okyere (2022). An Enhanced Jumping Spider Optimization Algorithm. *Carpathian Journal of Electrical Engineering*. https://www.researchgate.net/profile/Atanga-Betrand-N/publication/370415442_AN_ENHANCED_JUMPING_SPIDER_OPTIMIZATION_ALGORITHM/links/644efebf97449a0e1a6b225e/AN-ENHANCED-JUMPING-SPIDER-OPTIMIZATION-ALGORITHM.pdf
43. EA Frimpong, **FB Effah** (2022). Exposing Students to Engineering in Society. *ADRRI Journal of Engineering and Technology*. https://ejournal2.undip.ac.id/index.php/ijee/article/view/10908
44. Asare Koduah, **Francis Boafo Effah** (2022). Fuzzy-Logic-Controlled Hybrid Active Filter for Matrix Converter Input Current Harmonics. *Energies*. https://doi.org/10.3390/en15207640
45. **FB Effah** (2022). Multi-Objective Congestion Management of Transmission Lines Using Demand Response and Static Var Compensators. *Carpathian Journal of Electrical Engineering*. https://

openurl.ebsco.com/contentitem/gcd:163881397?sid=ebsco:plink:crawler-gcd&id=ebsco:gcd:163881397&crl=c&jrnl=18437583

46. Emmanuel Asuming Frimpong, **Francis Boafo Effah** (2021). A framework to guide industrial trips in engineering training institutions. *International Journal of Electrical Engineering Education*. https://doi.org/10.1177/00207209211013454

47. **FB Effah** (2021). Exposing Students to Engineering in Society. *ADRRI Journal of Engineering and Technology*. https://scholar.google.com/scholar?cluster=11814605068343483445&hl=en&oi=scholarr

48. Frank K.A. Nyarko, G. Takyi, **F.B. Effah** (2021). Impact of the constitutive behaviour of the encapsulant on thermo-mechanical damage in (c-Si) solar PV modules under thermal cycling. *Scientific African*. https://doi.org/10.1016/j.sciaf.2021.e00767

49. Eric Tutu Tchao, David Ato Quansah, Griffith Selorm Klogo, **Francis Boafo-Effah**, Seth Kotei, Clement Nartey, Willie K. Ofosu (2021). On cloud-based systems and distributed platforms for smart grid integration: Challenges and prospects for Ghana's Grid Network. *Scientific African*. https://doi.org/10.1016/j.sciaf.2021.e00796

50. Frank Kwabena Afriyie Nyarko, Gabriel Takyi, **Francis Boafo Effah** (2021). Study on Creep Damage in Sn60Pb40 and Sn3.8Ag0.7Cu (Lead-Free) Solders in c-Si Solar PV Cell Interconnections under In-Situ Thermal Cycling in Ghana. *Crystals*. https://doi.org/10.3390/cryst11040441

51. Mubarak Sani Ellis, **Francis B. Effah**, Abdul-Rahman Ahmed, Jerry J. Kponyo, Javad Nourinia, Changiz Ghobadi, Bahman Mohammadi (2020). Asymmetric circularly polarized open-slot antenna. *International Journal of RF and Microwave Computer-Aided Engineering*. https://doi.org/10.1002/mmce.22141

52. **Francis Boafo Effah**, Philip Gasu, Philip Okyere, Amevi Acakpovi (2020). Harmonics of CF and LED lamps - Maximum Penetration Perspective on Power Quality in Distribution Systems. *Jurnal Nasional Teknik Elektro*. https://doi.org/10.25077/jnte.v9n3.795.2020

53. **Francis Boafo Effah** (2020). Harmonics of CFL and LED lamps-Maximum Penetration Perspective on Power Quality in Distribution Systems. *Jurnal Nasional Teknik Elektro*. https://www.academia.edu/download/66157129/19_Harmonics_CFL.pdf

54. William Duodu Asihene, **Francis Boafo Effah**, Erwin Normanyo (2020). Utilizing Unified Power Flow Controller for Stability Improvement of the Electric Power Transmission System of Ghana. *Jurnal Nasional Teknik Elektro*. https://doi.org/10.25077/jnte.v9n1.760.2020

55. **FB Effah** (2020). Utilizing Unified Power Flow Controller for Voltage Stability Improvement of the Electric Power Transmission System of Ghana. *Jurnal Nasional Teknik Elektro*. https://jnte.ft.unand.ac.id/index.php/jnte/article/view/760

56. M.S. Ellis, A.R. Ahmed, J.J. Kponyo, **F.B. Effah**, J. Nourinia, C. Ghobadi, B. Mohammadi (2019). Compact broadband circularly polarized printed antenna with a shifted monopole and modified ground plane. *Journal of Instrumentation*. https://doi.org/10.1088/1748-0221/14/11/p11026

57. **FB Effah**, P Okyere (2019). Optimized space-vector-modulated quasi Z-source NPC inverter for solar PV application. *Carpathian Journal of Electrical Engineering*. https://www.researchgate.net/profile/Francis-Effah/publication/344175863_OPTIMIZED_SPACE-VECTOR-MODULATED_QUASI_Z-SOURCE_NPC_INVERTER_FOR_SOLAR_PV_APPLICATION/links/5f58eb47a6fdcc1164045bc3/OPTIMIZED-SPACE-VECTOR-MODULATED-QUASI-Z-SOURCE-NPC-INVERTER-FOR-SOLAR-PV-APPLICATION.pdf

58. **FB Effah** (2019). Power Loss Analysis of Hybrid PV and PEMFC Storage Integration System Using Fault Tree Analysis. *Ghana Journal of Technology*. https://www.academia.edu/download/110375534/58.pdf

59. **Francis Boafo EFFAH**, Philip OKYERE, Mubarak Sani ELLIS, Patrick WHEELER, Alan WATSON, Jon CLARE, Joseph OJO (2019). THREE-LEVEL INDIRECT MATRIX CONVERTER WITH TWO SERIES Z-SOURCE NETWORKS. *DOAJ (DOAJ: Directory of Open Access Journals)*.

60. **Francis EFFAH**, Philip OKYERE, Patrick WHEELER, Alan WATSON, Jon CLARE (2018). A MODIFIED VIRTUAL SPACE VECTOR MODULATION TECHNIQUE FOR Z-SOURCE NPC INVERTERS. *Repository@Nottingham (University of Nottingham)*.

61. John Kojo Annan, **Francis Boafo Effah**, John E. Quaicoe (2018). Reliability Assessment of Battery-Assisted and Electrolyser-Battery Integrated PV Systems for Off-Grid Applications.
62. Chunyang Gu, Pat Wheeler, Alberto Castellazzi, Alan J. Watson, **Francis Effah** (2017). Semiconductor Devices in Solid-State/Hybrid Circuit Breakers: Current Status and Future Trends. *Energies*. https://doi.org/10.3390/en10040495
63. **FB Effah** (2016). Hybrid HVDC circuit breaker with self-powered gate drives. *IET Power Electronics*. https://doi.org/10.1049/iet-pel.2015.0531
64. **FB Effah** (2012). Space-vector-modulated three-level inverters with a single Z-source network. *IEEE Transactions on Power Electronics*. https://ieeexplore.ieee.org/abstract/document/6307882/

Book chapters 2

1. **F Effah** (2015). Integrated design by optimization of electrical power systems for more electric aircraft. *MEA 2015*. https://www.researchgate.net/profile/Francis-Effah/publication/274054403_Integrated_Design_by_Optimization_of_Electrical_Power_Systems_for_More_Electric_Aircraft/links/5512e6300cf268a4aaeb70ec/Integrated-Design-by-Optimization-of-Electrical-Power-Systems-for-More-Electric-Aircraft.pdf
2. **FB Effah** (2012). Optimal switching pattern for space vector modulated Z-source NPC inverter. *6th IET International Conference on Power Electronics, Machines and Drives (PEMD 2012)*. https://doi.org/10.1049/cp.2012.0244

Conference papers 11

1. Edmund Kwafo Adjei-Saforo, Emmanuel Asuming Frimpong, **Francis Boafo Effah**, Misbawu Adam, Shahrouz Ebrahimpanah, Su Hongsheng (2023). Duty Ratio Optimization for a Multi-Level Polyphase Cascaded H-Bridge Grid-Interactive Inverter Using Model Predictive Current Control Based on Explicit Integration Algorithm. https://doi.org/10.1109/africon55910.2023.10293570
2. Peter Noble Tawiah-Mensah, Jonathan Addison, Samuel Dei Oppong, **Francis Boafo Effah** (2022). An improved Perturb and Observe Maximum Power Point Tracking Algorithm with the capability of drift avoidance in PV systems. *2022 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica53997.2022.9905377
3. Famous Ghanyo Tay, Michael Tudzi, John Wobil, **Francis Boafo Effah** (2022). Improved Voltage Control in LV Grid-Connected PV System Using Active Power Curtailment with Battery Energy Storage System. *2022 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica53997.2022.9905329
4. Edmund Kwafo Adjei-Saforo, Emmanuel Asuming Frimpong, **Francis Boafo Effah**, Misbawu Adam, Shahrouz Ebrahimpanah, Su Hongsheng (2022). Model Predictive Current Control Method with Enhanced Performance for a Three-Phase Five-Level Cascaded H-Bridge Inverter Connected to Grid. *2022 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica53997.2022.9905258
5. Etornam Komla Ahorsu, Chinenye Chibueze Vincent, Odei Kelvin Mireku, **Francis Boafo Effah** (2022). Power Electronic Converter Control Emulating Synchronous Machine Characteristics for Renewable Energy Integration. *2022 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica53997.2022.9905349
6. Kwabena Owusu Sarfo, William Mbora Amuna, Bright Nkabe Pouliwe, **Francis Boafo Effah** (2020). An Improved P&O MPPT Algorithm Under Partial Shading Conditions. *2020 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica49420.2020.9219851
7. **Francis Boafo Effah**, Patrick Wheeler, Philip Okyere, Alan Watson, Joseph Ojo, Jon Clare (2020). Three-Level Indirect Matrix Converter With Series Z-source Networks. *2020 IEEE PES/IAS PowerAfrica*. https://doi.org/10.1109/powerafrica49420.2020.9219992
8. **Francis B. Effah**, Patrick W. Wheeler, Alan J. Watson, Jon C. Clare (2017). Quasi Z-source NPC inverter for PV application. https://doi.org/10.1109/powerafrica.2017.7991215
9. Chunyang Gu, Pat Wheeler, Alberto Castellazzi, Alan J. Waston, **Francis Effah** (2016). A survey on configurations of current-limiting circuit breakers (CL-CB). https://doi.org/10.1109/epe.2016.7695679

10. Chunyang Gu, **Francis Effah**, Alberto Castellazzi, Alan J. Waston, Pat Wheeler (2016). Novel current-limiting strategy for solid-state circuit breakers (SSCB) without additional impedance. https://doi.org/10.1109/epe.2016.7695675

11. **FB Effah** (2013). Space-vector-modulated three-level Z-source hybrid direct AC-AC power converter. *2013 15th European Conference on Power Electronics and Applications (EPE)*. https://ieeexplore.ieee.org/abstract/document/6634402/

Reports 1

1. **FB Effah** (2014). Three-level Z-source hybrid direct AC-AC power converter topology. *University of Nottingham*. https://scholar.google.com/scholar?cluster=11959210498368667027&hl=en&oi=scholarr