Bio-data

1. **Family name:** OPOKU
2. **First names:** Richard
3. **Nationality:** Ghanaian
4. **Place of Residence:** Kumasi, Ghana
5. **Civil status:** Married [3 Children: 1. Johnette Josephine Opoku (7 ½ years);

2. Suzette Samuel Opoku (6 years); 3. Antoinette Anne Opoku (3 ½ years)]

1. **Education:**

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| Institution(Date from - Date to) | Degree(s) or Diploma(s) obtained: |
| North Carolina A&T State University (NCATSU), USA (08/2009 – 06/2012) | PhD. Mechanical Engineering (Specialization: Thermofluids and Energy Systems Engineering) |
| North Carolina A&T State University, USA (08/2008 – 06/2009) | MSc. Mechanical Engineering (Research Thesis on CoolingManagement Systems) |
| Kwame Nkrumah University of Science and Technology, Ghana (08/2003 – 05/2007) | BSc. Mechanical Engineering |

1. **Language skills: Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)**

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| Language | Reading | Speaking | Writing |
| Akan | Mother tongue |
| English | 1 | 1 | 1 |

1. **Membership of professional bodies:**
* Member, Sector Skills Body for Energy Efficiency and Renewable Energy in Ghana
* Member, African Network of Solar Energy Experts (ANSOLE)
* Ghana Institution of Engineering (GhIE)
1. **Other skills: (e.g. Computer literacy, etc.):** Microsoft Office / Microsoft Excel / Microsoft Word / Zoom / MicrosoftPowerPoint / Google Drive / RET Screen / MATLAB
2. **Present position:** Senior Lecturer, Department of Mechanical Engineering, Kwame Nkrumah University of Science & Technology (KNUST), Ghana
3. **Years within the firm: 9 years (since 2012)**
4. **Key qualifications:** Dr. Richard Opoku has over 12 years of post-BSc and 10 years of post-MScexperience as mechanical engineer, energy auditor, energy efficiencyadvisor and solar PV system design and installation advisor. He is an energyconsultant with a lot of experience in research and development (R&D) ofprojects in energy efficiency, renewable energy (solar energy) for irrigation,refrigeration and air-conditioning systems, solar energy for coolingapplications and food preservation, solar crop drying and solar waterpumping. Dr. Richard Opoku also has over 10 years of professional experience in capacity building and training including training of facility managers on energy efficiency and renewable energy under DENG Institutional Capacity Building Project; training on operation and maintenance of refrigeration systems under Ghana Energy Commission Project in 2007, etc.
5. **Specific regional experience:**

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| Country | Date from - Date to |
| Ghana | Jul 2012- present (Faculty member & Consultant, KNUST) |
| USA | Aug. 2008 – Jun. 2012 (Research Fellow, NCATSU) |
| Ghana | Aug. 2007 – July. 2008 (Research /Teaching Assistant, KNUST) |

1. **Professional experience**

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| **Date from - Date to** | **Location** | **Company** | **Position** | **Description** |
| 05/2021 -12/2021 | Nationwide Ghana | UNIDO | Team Leader | Ghana Industrial Energy Efficiency Readiness Project: Supply of services related to organizing the national stakeholder engagement process for the development of industrial energy efficiency policy framework for Ghana. The project involves Diagnostic assessment of industrial energy efficiency in Ghana, and Drafting of government action plan (implementation plan/policy roadmap) for energy efficiency. |
| 01/2021 – 07/2021 | Nationwide Ghana | EPA, Ghana | Team Leader | Baseline Study for the Establishment of Measurement, Reporting and Verification (MRV) System for the Refrigeration and Air-Conditioning (RAC) Sector in Ghana According to the 2006 IPCC GHG Inventory and Emission Reporting Guidelines. The project involved surveys, analysis, concepts and recommendations for efficient and cost-effective MRV system according to IPCC Tier 2 reporting methodology. |
| 11/2020 – 07/2021 | Nationwide, Ghana | GIZ | Team Leader | Needs Assessment, Gap Analysis & Development of competency-based training (CBT) curriculum for solar powered irrigation systems (SPIS) in Ghana. I was the team leader that led the needs assessment study and gap analysis of SPIS installers, credit officers/project development officers from financial institutions, small-holder farmers, as well as the three training institutions which are going to host and conduct training in SPIS under the GIZ Green People’s Energy (GBE) Project in Ghana. I also lead the team to develop the CBT curriculum for the SPIS training and presented it during the national stakeholders’ workshop. |
| 10/2020 – 04/2021 | Kumasi, Ghana | Technical University of Munich - KNUST (TUM-KNUST) Living Lab Project at Yeboahkrom, Ashanti region | Energy Consultant | Consultancy services in Engineering Design, Procurement and Construction (EPC) of 20 kW solar mini-grid, and 22.0 kWh Li-ion battery storage for off-grid community power supply to households, a commercial center and water pumping station. I was the team leader for the engineering design of the systems, preparation of technical specifications of the components for procurement, and supervision of the installation works. |
| 09/2018 – 01/2019 | Kumasi, Ghana | GIZ | Project Team Leader | Energy Efficiency and Renewable Energy for Households and SMEs in Ghana: Lead the team to conduct scoping study and advising on energy efficiency and solar PV for 6,000 households and SMEs in Kumasi, Ghana. I was also the team leader in the data analysis and preparation of the project reports to GIZ. |
| 03/2018 – 07/2018 | Tamale & Kumasi, Ghana | DENG Solar Training Center (DSTC) | Consultant | Energy Efficiency Training for facility managers in selected institutions in Ghana– Pilot project in Kumasi and Tamale. I was the team leader in preparing the training manual, delivery of the onsite trainings and preparation of the reports. |
| 09/2017 – 11/2017 | Northern region, Ghana | United Nations Foundation (UNF) | Energy Consultant | Technical backstopping to the UN Foundation in line with the Sustainable Electrification of Health Facilities in Ghana. The project entailed technical verification of solar PV design blueprint and assessment of 3 pilot installations of solar PV systems in three health facilities in the northern region of Ghana. Technical verification of energy efficiency measures at the facilities was also undertaken. |
| 03/2016 – 04/2017 | China, Ghana | Ghana Energy Commission/UNDP | Project Team Leader | UNDP China-Ghana south-south cooperation project on renewable energy technology transfer (RETT): Scoping Studies on Solar Powered Irrigation Systems for Ghana Irrigation Development Authority (GIDA) Sites in the Northern Sector of Ghana. The findings of this scoping study have been included in the Ghana Renewable Energy Master Plan (REMP). |
| 04/2016 – 05/2016 | Kumasi, Ghana | Aeko Solar Limited | Consultant | Engineering design, installation and monitoring of 2.5 kW solar water pumping distribution system for a 21 -acre poultry farm at Pekyi No. 2 in Kumasi. The project installed a 2.5 kW solar PV system, 3 HP direct DC pump and distributed water system over a 1 km stretch from the borehole to the farm with water delivery of 30 cubic meter per day. I was the technical expert in the design of the system, which has been working since 2016. |
| 03/2014 – 11/2016 | Nationwide, Ghana | ECOWAS Renewable Energy and Energy Efficiency (ECREEE) | Associate Project Manager | Promotion of Renewable Energies in West Africa by Knowledge Exchange with Interactive Online Map - Promoting Energy Efficiency and Renewable Energy in Ghana. In partnership with REPOWERMAP, Switzerland, conducted studies on renewable energy and energy efficiency (RE&EE) on installed RE systems in Ghana. The results of this work have been published at:<http://mech.knust.edu.gh/research-collaborations><http://energycenter.knust.edu.gh/repowermap/index.php> |
| 01/2014 – 12/2015 | Nationwide, Ghana | KinKubi Engineering Limited | Consultant | Consultancy services for Engineering Design, Drilling, and Installation of Electro-Mechanized Solar Powered Satellite Water distribution systems for communities in Ghana. |
| 05/2014 – 06/2015 | Ghana & Norway | Norwegian Government, NORAD | Principal Investigator | Postgraduate Programme Development and Research in Energy Efficiency & Renewable Energy Technologies at KNUST. I was the team leader that led project development and capacity building of selected candidates across West-Africa for skills upgrade in energy efficiency and renewable energy research and projects.  |
| 05/2013 – 07/2014 | Accra, Ghana | Ghana Energy Commission | Associate Consultant | Reviewed and updated the Ghana Energy Sector Technology Catalogue under the Ghana Strategic National Energy Plan, SNEP 2010-2030. Project contract received from Ghana Energy Commission. |
| 01/2013 – 04/2014 | Ghana, Congo-Brazaville, Tanzania & Britain | Royal Society DFID-UK | Principal Investigator | African Clean Energy Research Alliance (ACERA) - Research and development of renewable energy technologies in partner countries. I was the project coordinator on behalf of Ghana, with the project involving University of Leeds (UK), and other 3 African Universities |

1. **Other relevant information (e.g., Publications)**

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| S/N | Research Publications |
| 1 | ***Richard Opoku****, Eunice A. Adjei, Divine K. Ahadzie, Kofi A. Agyarko (Jan, 2020).* Energy efficiency, solar energy and cost saving opportunities in public tertiary institutions in developing countries: The case of KNUST, Ghana. Alexandria Engineering Journal, *Vol 59 (2020), 417–428*. <https://doi.org/10.1016/j.aej.2020.01.011>. |
| 2 | *Kofi A. Agyarko,* ***Richard Opoku****, Robert Van Buskirk (Jan, 2020).* Removing barriers and promoting demand-side energy efficiency in households in Sub-Saharan Africa: A case study in Ghana. Journal of Energy Policy *(Elsevier)*, Vol 137 (2020) 111149. <https://doi.org/10.1016/j.enpol.2019.111149> |
| 3 | ***Richard Opoku,*** *Isaac Adjei Edwin, Kofi A. Agyarko* (*May,* *2019*). Energy efficiency and cost saving opportunities in public and commercial buildings in developing countries - The case of air-conditioners in Ghana. *Journal of Cleaner Production (Elsevier), Vol 230 (2019); 937-944.* <https://doi.org/10.1016/j.jclepro.2019.05.067> |
| 4 | ***Richard Opoku****; George Y. Obeng; Eunice A. Adjei; Francis Davis, Fred O. Akuffo* (*Mar, 2020*). Integrated system efficiency in reducing redundancy and promoting residential renewable energy in countries without net-metering: A case study of a SHS in Ghana. *Renewable Energy Journal (Elsevier)*, *Vol 155 (2020) 65-78.* <https://doi.org/10.1016/j.renene.2020.03.099>  |
| 5 | ***Richard Opoku****; Eunice A. Adjei; George Y. Obeng, Luc Severi, Abdul-Rahim Bawa (Mar, 2020).* Electricity access, community healthcare service delivery and rural development nexus: Analysis of 3 solar electrified CHPS in off-grid communities in Ghana. *Journal of Energy (Hindawi*), Vol 2020 (*Article ID 9702505) 1-10*. <https://doi.org/10.1155/2020/9702505>  |
| 6 | *Emmanuel. Y Osei,* ***Richard Opoku****, Albert K. Sunnu, Muyiwa S. Adaramola (Feb, 2020).* Development of High Performance Airfoils for Application in Small Wind Turbine Power Generation. Journal of Energy, (*Hindawi*). Vol 2020 (*Article ID 9710189*) 1-9. <https://doi.org/10.1155/2020/9710189> |
| 7 | ***Richard Opoku****; George Y. Obeng, Jo Darkwa, Samuel Kwofie* (*Mar, 2020*).Minimizing heat transmission loads and improving energy efficiency of building envelopes in sub-Saharan Africa using bio-based composite materials. *Scientific African Journal (Elsevier)*, *Vol 8 (2020) e00358.*<https://doi.org/10.1016/j.sciaf.2020.e00358> |
| 8 | *S. Colenbrander, J. Lovett, M. Suzan Abbo, C. Msigwa,* ***R. Opoku*** *(Jan, 2015).*Renewable energy doctoral programmes in sub-Saharan Africa: A preliminary assessment of common capacity deficits and emerging capacity-building strategies. *Energy Research & Social Science (Elsevier), Vol 5 (2015) 70–77.*<http://dx.doi.org/10.1016/j.erss.2014.12.010>. |
| 9 | ***Richard Opoku,*** *Kwadwo Mensah-Darkwa, Samed Muntaka (Mar, 2018).* Techno-economic analysis of a hybrid solar PV-grid powered air-conditioner for daytime office use in hot humid climates – A case study in Kumasi city, Ghana. *Journal of Solar Energy (Elsevier), Vol 165 (2018); 65-74.*<https://doi.org/10.1016/j.solener.2018.03.013>. |
| 10 | ***Richard Opoku****, S. Anane, I.A. Edwin, M.S. Adaramola, R. Seidu (Aug, 2016).* Comparative techno-economic assessment of a converted DC refrigerator and a conventional AC refrigerator both powered by solar PV. *International Journal of Refrigeration (Elsevier), Vol 72 (2016) 1–11.*<http://dx.doi.org/10.1016/j.ijrefrig.2016.08.014>. |