DUT DURBAN UNIVERSITY OF TECHNOLOGY

ELECTRICAL POWER ENGINEERING

Department of Electrical Power Engineering

Postgraduate Research Template

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	Student Name / Surname	Ntombenhle Mazibuko	**Start Date**	2018	**Supervisor**	**Prof. I.E Davidson**
	Title of Project	Modelling and Performance analysis of a Universal motor Fed from a Renewable energy Nano-grid	**Completion**	2020	**Co-Supervisor(s)**	**Dr. G Sharma**
	Program of Study (M Eng. / D Eng.)		**M Eng**			
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Synopsis of Research Project: (< 300 words)

Increases in global energy costs, coupled with a need to reduce harmful fossil-based emissions, are calling for a worldwide clean and efficient energy sources and technologies. In many developing countries the population distributions often show a major proportion of people leaving in remote and isolated settlement without access to national grid, while customers in these settlement are expecting a reduction in carbon emissions, increased efficiency within national grid and power supplied to remote communities. As expectations increases it is the responsibility of power systems research and design to develop new structures to meet these demands. It is often not economically viable to extend the existing grid to supply remote communities. Distributed generation (DG) looks to remedy these inadequacies by producing power close to its point of consumption, often utilising carbon neutral, renewable energy (RE) sources such as sun and wind. Nano-grid falls under DG and are mainly suited for niche application such as power supplies for remote isolated locations.

Further, the universal motors are widely used in house hold appliances because of the high speed capability and torque response capability. Hence, the research seeks investigate the modelling and performance analysis of a universal motor fed from a Nano-grid having the electric power generation from diverse renewable technologies. A field test of a universal motor connected to the renewable energy Nano-grid through an inverter (or chopper) will be carried out. A mathematical model of a system with a 5kw Solar PV suppling a universal motor through DC-DC buck-boost converter and an inverter will be simulated in matlab/PSIM simulation software. Comparison of both field test and simulation result will be done. Results obtained will be presented and discussed, for onward implementation in uplifting relevant rural communities and domestic customers.