Research Topics in Renewable Energy for 2020

CENTRE FOR RENEWABLE & SUSTAINABLE ENERGY STUDIES

Dosent / *Lecturer:* Dr N. Gule	**Email:**	nathie@sun.ac.za
	Tel:	+27 21 808 4103

Fakulteit / *Faculty:* **Engineering**

Department / *Department:* Electrical and Electronic Engineering

Navorsingsarea / *Area of Research:*
Electrical Machines and Drives

Algemene beskrywing van navorsingsveld / *General description of research area:*
Sensor-less control of a doubly fed induction generator (DFIG) is achieved when the DFIG is successfully controlled without the mechanical speed sensors at the shaft of the DFIG. In sensor-less control, the information on the rotor speed is extracted from measured stator voltages and currents at the DFIG terminals. The advantage of sensor-less control is low cost and high reliability of the DFIG in the wind energy conversion system (WECS). Further reliability and improvement of the DFIG can be achieved through the use of the brush-less DFIG (BDFIG), that is, a DFIG without the slip-ring and brush assembly, in the WECS. A BDFIG can be realised through a double stator winding DFIG or a normal DFIG employing a rotary transformer. Vector controlled drives rely on accurate machine parameters. These parameter tend to vary with temperature and over time, and the control can be enhanced through online parameter estimation. Therefore, the research focusses on the development of BDFIGs as well as the development of sensor-less control strategies for BDFIGs.

Lys van onderwerpe/*List of topics:*	***M.Eng. (Research)***	**Ph.D.**	**Funding**
Sensor-less Control of Brushless Doubly Fed Induction Generators	**X**	**X**	**None**
Parameter Estimation for Brushless Doubly Fed Induction Generators	**X**		**None**
Design of a Three Phase Rotary Transformer for Wind Energy Conversion Systems	**X**		**None**

Spesifieke voorvereistes / *Specific requirements*: A Masters degree in the relevant scientific field of study is required to enrol for a PhD and an Honours degree in the relevant field is required to enrol for a Masters.

Befondsing beskikbaar / *Funding available:* N/A