



RESEARCH MOTIVATION

TOWARDS A SMART INTEGRATED AFRICAN ELECTRIC POWER GRID

The last century has demonstrated that ***every facet of human development is woven around a sound and stable energy supply regime***. The organization of society, national and social security are highly dependent on the availability of energy supplies. There is a strong correlation between the per capita gross national product (GNP), per capita energy consumption and the standard of living of any society. Hitherto, Africa has had the lowest energy per capita in the world. This makes energy poverty one of the major causes of under-development in the continent. Since electricity is the engine of economic growth and development, it is imperative that concerted efforts and aggressive investments made in infrastructure that will facilitate trade and investments across the continent with an "***Integrated African Electric Power Grid***" driven by modern tools and advances of *HVDC Engineering and FACTS Technology*, which is central in supporting Africa's sustained economic growth and development. With earnest anticipation, we labour and aspire to see the realization of a ***Smart Integrated African Electric Power Grid, built on the cornerstone of green energy and harnessing over 75000MW potential*** of Africa's clean renewable hydro-electric power as a share of a vast energy mix made of conventional and alternative energy resources.

African problems require African home-grown solutions. African countries with visionary leaders are poised to undertake their greatest challenge to transform their economies from resource-based to manufacturing and knowledge-based economies. This will involve taking full charge of our resources, integrating our markets, building infrastructure, investing in human capital and creating an enabling environment for domestic and foreign direct investments to thrive in Africa. A key strategy is for our national governments to invest in human capital while building a critical mass of skills on the continent and enable us become a major player in the global arena. ***We therefore have to train, develop and supply Africa with highly motivated, marketable and competent professionals*** who understand the new and existing issues concerning the profession, namely: the generation, transportation, distribution and utilization of electrical energy to serve consumers in an efficient, safe, economic and reliable manner, in a changing smart utility environment.

The Department of Electrical Power Engineering at Durban University of Technology is engaged in research in technology relating to HVDC, power systems (including lines) and power electronics relating to AC systems in a smart grid utility environment. The focus is on:

- **Building Capacity in Electric Power and HVDC Engineering**
- **Smart Grids and Renewable Energy Technologies**
- **Research, Independent Testing & Verification Services**
- **Power System Solutions and Smart Utility services**

DUT-EPE Research is positioned to be a co-builder of Africa and South Africa's future – *Towards a Smart Integrated African Electric Power Grid* driven by HVDC engineering and FACTS technology in a smart utility era; championed by Africa's largest electric utility *Eskom* and supported by Africa's foremost economic giant, the *Republic of South Africa*.