

FlexNET 2008

Power Systems Electronics

Work-stream

Task Leaders

Dr S. Finney Strathclyde University

Prof. T. Green Imperial College

Prof. N. Jenkins Cardiff University

Power Electronics in Transmission and Distribution..

- **Drivers for adoption.**

- Improved utilisation of existing assets, Provision of Key functionality, Integration of new energy sources, Increased energy capture.

- **Deployment**

- Limited to niche applications, High value specialist designs.

- **Barriers to adoption.**

- Losses, Complexity, Cost, Uncertainty.

Background.

- **Changing patterns electricity generation and use.**

- Increased use of renewable generation. Resource remote from demand centres with variable energy output.
- Substitution of 'clean' electricity for other energy sources. transport, heating etc

- **Technology.**

- Innovation in power conversion technologies for high voltage, high power applications.
 - M.V. Drives for the Oil/Mining sector.
 - Voltage source HVDC.
- Improvements to power semiconductor devices.

Workstream Activities

- **Hybrid power switching systems.**
 - Typical application: Assisted tap-change systems.
 - Mixed power electronic and mechanical technology
 - Fast Response times
 - Minimisation of device conduction loss.
- **Multi-terminal HVDC**
 - Stability and control of complex MT-HVDC systems.
 - Topologies for MT-HVDC transmission.
 - Power converters and circuit topologies for MT-HVDC systems.
 - Protection of MTDC systems.