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SYDNEY



## Intelligent Monitoring of Electricity Grids

**The electricity grid delivers electrical energy from diverse generation sources to end users. It is a complex, continuously-evolving and dynamic system. Advances in sensing devices, digital technologies and communications make it possible to engineer systems for accurate, online, real-time monitoring of the grid and intelligent, automated control of its operation.**

### Competitive advantage

- Expertise in HV AC and DC transmission systems, equipment, components and devices
- Leaders in smart-grid monitoring systems with embedded intelligence, e.g. novel sensing devices, signal processing, data analytics, to provide on-line monitoring of power flow, power quality, losses/efficiency and network transients
- Novel diagnostic techniques for insulation assessment—e.g. ultra-high frequency detection of partial discharges, dielectric spectroscopy and frequency response analysis
- Expertise in novel dielectric materials for electro-technology—e.g. high-k dielectrics for energy storage capacitors, polymeric nanocomposites and biodegradable insulating liquids

### Impact

- Making electricity supply systems more reliable and better managed

### Successful applications

- Development of intelligent, robust online condition monitoring for electricity substations and other strategic assets of high-voltage electricity grids
- Online partial discharge monitoring in cables and transformers
- Distributed online monitoring of SWER networks and detection of high-impedance arcing faults

### Capabilities and facilities

- High Voltage laboratory with various HV sources available for testing: impulse, 50 Hz AC, DC, VLF, variable frequency
- Wide range of state-of-the-art measurement instruments for dielectric insulation study—sensors, partial discharge, dielectric dissipation factor, space charge, time and frequency domain spectroscopy, thermal imaging, and fast data acquisition systems

### More Information

Associate Professor Toan Phung

School of Electrical Engineering and Telecommunications

T: +61 (0) 2 9385 5407

E: [toan.phung@unsw.edu.au](mailto:toan.phung@unsw.edu.au)

UNSW Knowledge Exchange

[knowledge.exchange@unsw.edu.au](mailto:knowledge.exchange@unsw.edu.au)

[www.capabilities.unsw.edu.au](http://www.capabilities.unsw.edu.au)

+61 (2) 9385 5008