# Market-oriented Optimisation of Smart Embedded Energy Networks

**Industry-sponsored PhD Scholarship at Swinburne University of Technology, Melbourne, Australia** ($26,288 p.a. stipend indexed & tax-free, $5,000 p.a. project support)

An industry-sponsored PhD scholarship is available for carrying out PhD research in a new project on **Market-oriented Optimisation of Smart Embedded Energy Networks** supported by the industry partner CGREI Pty Ltd within the **Intelligent Agent Technology Group** & **Smart Energy Management Research Centre** at Swinburne University of Technology. Melbourne, Australia. The project aims at developing new computational models and market-based mechanisms for decision support in optimising cost-benefits and pricing options in smart embedded electricity networks, i.e. embedded networks enhanced with distributed generation, storage and demand side management options.

Embedded networks offer electricity market constructs that allow for aggregating and on-selling energy for consumers within multi-tenant precincts in order to improve efficiencies and lower costs for the participants. Distributed generation and storage within the embedded networks together with demand side management technologies and strategies have impact on the demand profile and maximum demand as seen from the external network perspective. The impact of these components has the potential to provide further efficiencies and greater flexibility in seeking advantageous energy contracts with utilities and to minimise the ongoing energy cost to the embedded network participants. The key question is what is the optimal architecture and technology mix of the distributed generation, embedded storage and demand management strategies to yield lowest cost energy supply to the embedded network participants while maximising the economic benefit to the embedded network owner. This research will address that question by focussing on computational market-oriented modelling and optimisation of cost-benefits and pricing options in smart embedded electricity networks. It will develop a decision support system prototype for finding the most cost-benefit efficient architecture and technology mix for smart embedded networks, which will be taken up for further commercialisation by the project industry partner.

Potential candidates with background and interests related to mathematical, game-theoretical, economic or distributed energy system modelling and optimisation, and interested in carrying out leading edge and industry-relevant research, are encouraged to contact Professor Ryszard Kowalczyk (rkowalczyk@swin.edu.au) with the following details:

- A detailed curriculum vitae
- An (electronic) copy of undergraduate and postgraduate transcripts
- A motivation letter preferably with a short outline of the proposed approach
- Evidence of formal research experience if applicable (e.g. degree by research, research projects, publications)
- Evidence of English proficiency (native English speaker, previous studies in English in certain cases, or IELTS of 6.5 with no band below 6)

**Scholarship includes:**
- Annual stipend $26,288 (indexed and tax free) for three years (with possible 6 month extension)
- Tuition fees scholarship for up to four years
- Project support up to $5,000 per annum
- Thesis allowance

**Applications close:** ASAP (open until filled)