



Call for expressions of interest in PhD scholarship

Demand response in the agricultural sector – a socio-technical study

Centre for Sustainability, University of Otago

Developments in New Zealand's agricultural sector, particularly in dairying, have driven significant growth in electricity demand, mainly due to on-farm irrigation. Around 20% of electricity consumed in the South Island of New Zealand, for example, is used for irrigation. Other electricity-intensive farm processes include water heating and milk chilling.

Around 80% of New Zealand's electricity is generated from renewable sources, mainly hydro, geothermal and wind, although solar generation is increasing. Most renewables are variable over different timeframes, so balancing variable supply with variable demand requires rapid response which has typically been provided by gas and/or hydro generation. However there is increasing interest in New Zealand in activating demand response, whereby electricity users are paid to shed their load for short periods to assist with the management of variability. Most such arrangements to date have been with major industries, but agricultural consumers offer a largely untapped opportunity with potential mutual benefit to farmers and grid managers by optimising the time of electricity use. This research will examine the potential for farmers to engage in demand response.

The project may also incorporate the allied issue of optimising water use. Irrigation has significant implications for New Zealand's electricity market as the majority of New Zealand's electricity is produced through hydroelectric generation. Optimising demand response in the agricultural sector will not only help the energy efficiency of that sector but, in some regions, could also help to alleviate the water-related problems in a dry year where the scarcity of water impacts hydroelectricity generation as well as irrigation.

We envisage that this research will take a socio-technical approach. It will examine farmer interest in electricity demand response, examine the barriers that farmers face in engaging in demand response, and identify solutions to improve adoption of demand response strategies. Candidates with a background in socio-technical studies would be ideal, although those with a background in social or physical sciences will be considered if they have an interest in extending their theoretical and methodological scope.

We are seeking a PhD student (NZ or international) to undertake this research.

A 3-year scholarship of \$27,500 p.a. plus fees is available.

The scholarship is funded by Science for Technological Innovation, a National Science Challenge.

The successful candidate will be based at the Centre for Sustainability, University of Otago (<http://www.otago.ac.nz/centre-sustainability>).

Applications for this position should include:

- Covering letter including preferred start date, if successful
- CV including referee details
- Academic transcripts

Please send to Dr Janet Stephenson: janet.stephenson@otago.ac.nz by Weds 22 February 2017

For further information please contact either Dr Janet Stephenson: janet.stephenson@otago.ac.nz or Dr Sara Walton sara.walton@otago.ac.nz