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Peak demand, bending the demand curve and demand side management

**Impacts upon residential electricity consumption: A Queensland
perspective**



Abstract

As the world undertakes a paradigm shift in how it consumes its resources, companies and governments are looking for cleaner and more efficient ways to undertake business. The supply and consumption of electricity is no exception, with one possible solution to greater electrical efficiency via demand side management. With this, governments and electricity companies have conducted numerous trials to determine whether the perceived benefits from demand side management initiatives apply to their set of circumstances. To date nearly all of the trials have indicated that benefits do in fact exist and are achievable. In fact with one benefit being reductions in electrical consumption, only minor reductions are needed to generate both monetary and environmental benefits. This paper reports upon the results of a joint trial undertaken by Energex Limited and Ergon Energy Corporation Limited in Queensland, Australia. In examining the performance of two alternative, yet popular dynamic pricing structures, the paper focuses upon the behaviour of 3,000 participants across three distinct climatic regions between January 2011 and February 2012. Participants within the experiment differed in diverse ways, each with varying attributes such as locality, family size, household income levels, household dwelling attributes and appliance characteristics. As a result, the paper examines the impacts of locality, air-conditioning penetration, household income levels and annual household consumption upon participants' abilities to react to price signals. Via utilising statistical techniques such as independent-sample t-tests, this paper finds that customers on both dynamic pricing structures reduce electricity consumption during peak periods on event days in both summer and winter seasons. Results further indicate that differing participant attributes affect the magnitude of response in various ways.