

## **Abstract – Padraig Curtin**

The “smart grid” is a concept currently attracting a significant amount of attention in the world of research. With the right technological developments there are significant monetary and energy savings to be made. The overall aim of this thesis is to explore the potential for smart nanogrids to achieve these savings. The thesis outlines a system designed and implemented on a hardware prototype that combines nanogrids, distributed renewable generation, linearly optimised load scheduling and a real time electricity pricing model to reduce consumer electricity expenditure. A literature review of nanogrid technology based on the web of science database is presented. Simulations covering a thirty day time span demonstrate the potential for a household to cut its electricity bill by up to 39.5% by installing the system.