NP1003

RENEWABLE ENERGY FOR RETIREES

Research Question

Eleven per cent of Australians are retired. By 2050, the proportion will be greater than 20 per cent.

Is the energy use of retirees different to that of the general population? If so, how will that impact on the design of renewable energy systems for retirement precincts and individual homes?

Methodology

This study will use detailed household energy use data to characterise energy use profiles for different demographics, with a focus on retirees. We want to know whether there are significant differences in the patterns of energy use between demographic groups, and in particular whether retirees differ from the wider community.

So far we have identified two sources of data for which we have both detailed energy use data and demographic data.

Lochiel Park is a residential development of about 100 homes in South Australia. Each house is designed for low energy use, and has at least 1 kW of photovoltaic panels per 100 m^2 of floor area. Energy data is available at one minute intervals over several years.

The Smart Grid, Smart City programme collected half-hourly energy use and demographic data from about 3800 households. About ten per cent of these households have all occupants aged 70+.

We will use this data (and data from retirement villages, if available) to develop methods for characterising energy use, then examine how different patterns of energy use can be met using renewable energy systems

Figure 1: Aerial photograph of Lochiel Park, a model green village in South Australia (NearMap, July 2012)

Discussion

It is likely that the load profiles of retirees have distinct characteristics when compared to other demographics, such as a higher proportion of energy use during the day. If there is a significant difference between the energy use of retirees and the wider community, renewable energy system designs should take into account this difference.

If distinct patterns of energy use are found to be present in energy load profiles, further investigation, including questionnaires or interviews, may be required to provide insight into the reasons for these differences.

Once information has been gathered about the time-varying energy use patterns of retirees, ways to reduce the GHG emissions arising from such use will be investigated. These will include:

- reducing energy use
- making greater use of renewable power from the grid by load shifting (with and without storage)
- using local generation from renewable sources.

The research will develop methods that will help energy system designers characterise the energy use of a retiree household or precinct, and design renewable energy system to meet these needs.

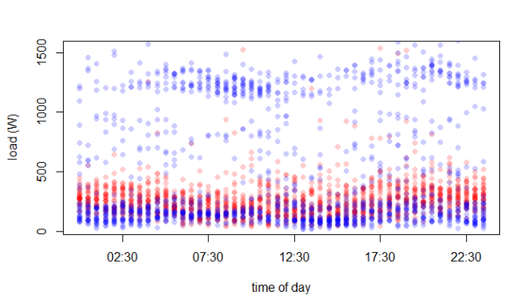

Figure 2: An example of electricity load vs time of day for a sample household in January (red) and July (blue).

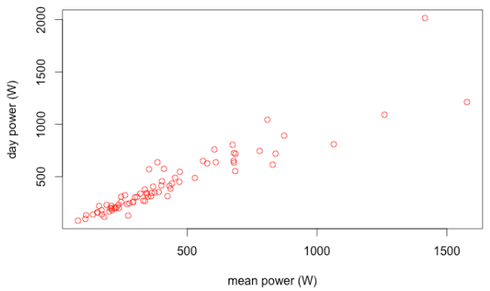

Figure 3: Daytime power versus average power for 75 households.

Conclusions

It is important to be able to accurately predict the electricity demand of residents, and match demand for energy with supply. However, if the demography of a precinct or population changes, questions arise around how this may affect energy demand, and if it does, what is the impact of that change on providing renewable energy for that precinct? Conclusions from the research will provide guidance on this.

Anticipated impacts

Information gained from this research will not only aid further research in this area, but will also directly assist developers of such retirement community precincts who wish to optimise the use of renewable energy in their villages.

Key statement

The work undertaken in this thesis will help the Australian renewable energy sector provide efficient and effective renewable energy systems that are tailored to the needs of an ageing population.

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