

RP1013

WHAT DRIVES PEAK ENERGY DEMAND?

Problem

Peak energy demand is a major issue for utility providers and the grid. In the residential sector, an accurate understanding of electricity demand is difficult to achieve due to a multitude of driving factors and the lack of reliable data for empirical analysis. In NSW, the peak 20% of grid capacity is only required to support energy demand for less than 1% of the year as illustrated in Fig 1. This places a financial burden on the electricity market and contributes towards rising electricity prices.

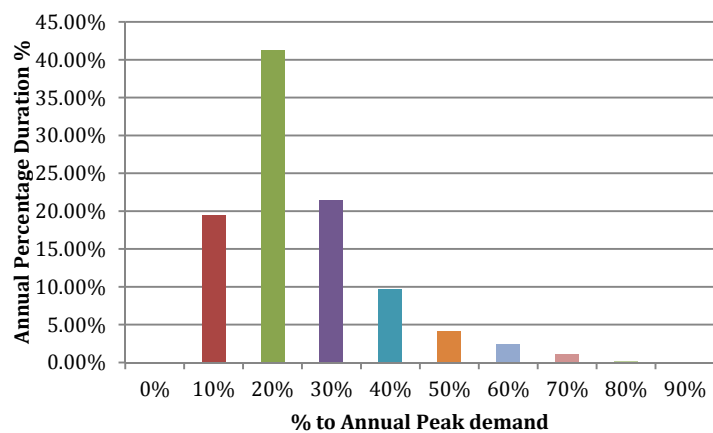


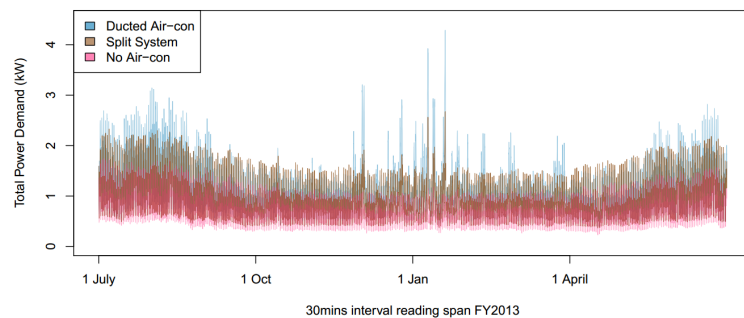
Figure 1 Peak Demand Cumulative Time Profile

This research focuses on the exploration and analysis of what are the key drivers that contribute towards peak energy demand.

Solution

The current study collects data generated from Australian's first commercial grade Smart Grid Trial – Smart Grid Smart City (SGSC). Then through proper data treatment, produces analytical results that reveals how different factors drive peak energy demand.

The result of the current research could be used by utility providers to better manage peak demand supply; it can significantly bring transparency to decision makers and even end users of household appliances, so they could make informed decisions on where to target and improve energy efficient measures and reduce peak energy consumption.



Ducted air-conditioning is the main contributor for residential peak energy demand!

Benefits

Benefit to various stakeholders:

Help end users to make informed decisions when purchasing household appliances, which leads to less impact on peak energy demand.

Provide critical groundwork for future researches related to peak demand studies.

Inform government decision makers on potential pathways to address peak demand issues.

Identify potential development opportunities of more efficient household appliances for industry sector.

Through effective integration of distributed generation, demand side management, and energy efficiency, it is possible to reduce peak demand, therefore better utilising resources and materials in the grid sector, and also significantly reduce carbon emissions.

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