## RP2002: INTEGRATED ETWW DEMAND FORECASTING AND SCENARIO PLANNING FOR PRECINCTS

# ELECTRICITY LOAD FORECASTING FOR LOW CARBON COMMUNITIES

### Problem

The residential and commercial sectors are one of Australia's largest emitters of greenhouse gasses. These sectors also have huge greenhouse emissions reduction potential.

Within a precinct, containing residential and commercial users, greenhouse gases are not only emitted by electrical energy usage. Emissions also come from gas energy, transport, waste and water. Between each of these domains, there are strong interactions where a reduction in one area could cause an increase or reduction in another. Understanding these interactions is essential to achieve reductions.

**Figure 1: Zero Emissions Home with rooftop solar PV and solar hot water.**

### Solution

The aims of the RP2002 project is to develop an integrated demand modelling tool for low carbon precincts. The tool will model the demand and demand interactions for energy, transport, waste and water. The model will capture the greenhouse gas emissions and cost to implement for a scenario being analysed. The focus of this poster is the energy domain of the project, outcomes will be to:

1) Develop the electrical energy load forecast model for commercial and residential users.

2) Develop aggregated profiles that represent the precincts in the electricity network. Analyse the grid impacts of low carbon communities.

3) Investigate how precinct grid stability and efficiency can be improved.

4) Produce the energy component of the integrated demand modelling tool. Design the tool in a way that it can be used by planners, developers and consultants to set up scenarios and calculate demand estimates for the four domains.

**Modelling the demand interactions between energy, transport, waste and water in a precinct is essential to cheaply reduce greenhouse gas emissions in reality.**

### Benefits

The project will develop a new understanding of the greenhouse gas emission interactions between Energy, Transport, Waste, Water domains. This knowledge will lead to a tool which can be used by planners, developers and consultants to set up scenarios and calculate demand estimates. This model will be able to show the cheapest options for greenhouse gas emission reduction within a precinct.

The energy component of the project will analyse grid impacts of low carbon communities, such as the effect of solar on grid stability and determine how to maximise the solar energy generation of a precinct. The models developed in the project will be able to simulate smart grid technologies and investigate other methods to further reduce demand and losses.

Call to action: Think about how greenhouse gas emissions interact between the four domains. What new ways can this be managed?

### Contact

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